

Smoking and public health: a review
of reviews of interventions to increase
smoking cessation, reduce smoking initiation
and prevent further uptake of smoking

Evidence briefing

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Bhash Naidoo

*with Daniel Warm,
Robert Quigley and
Lorraine Taylor*

Foreword

In 1999 the white paper *Saving Lives: Our Healthier Nation* was published. It signalled that the Health Development Agency (HDA) would be established and that it would have, as one of its roles, building the evidence base in public health with a special focus on reducing inequalities in health. In April 2001 the Department of Health published its Research and Development Strategy. The strategy identified the task for the HDA as 'maintaining an up-to-date map of the evidence base for public health and health improvement, advising on the setting of standards in the light of evidence for public health and health promotion practice, and effective and authoritative dissemination of evidence to practitioners' (Department of Health, 2001). To translate this into reality the HDA has developed a number of ways of taking a systematic approach to compiling the evidence, identifying gaps and making the evidence base accessible. The publication of this, one in a series of evidence briefings, marks a significant milestone in that activity.

This evidence briefing is a review of reviews about the effectiveness of public health interventions to reduce smoking initiation and increase smoking cessation. The necessity for reviewing reviews, or tertiary level research, stems from the proliferation over the last decade or more of systematic and other types of review in medicine and public health. The HDA has published other evidence briefings that deal with alcohol misuse, teenage pregnancy and parenthood, HIV prevention, the prevention of sexually transmitted infections, obesity, prevention of low birth weight, breastfeeding, accidental injuries in children and older people, the promotion of physical activity, and health impact assessment. Other briefings will include drug use prevention, depression in older people, and good mental health.

Taken together these briefings will provide a comprehensive synthesis of the evidence drawn from

systematic and other kinds of reviews. They will all be available on the HDA's website www.hda.nhs.uk/evidence and the electronic versions will be updated on a regular basis as new evidence becomes available.

The first editions of the briefings have been based on evidence drawn from systematic and other kinds of reviews. This means that the type of evidence that does not traditionally find its way into reviews has not been considered in detail for these documents. In future editions of the evidence briefings it is planned to extend the coverage of evidence beyond reviews to other methodologies and other types of study, where these are available.

The construction of the HDA Evidence Base has involved collaboration with a number of partners who have interests and expertise in practical and methodological matters concerning the drawing together of evidence and its dissemination. In particular the HDA would like to acknowledge the following: the NHS Centre for Reviews and Dissemination at the University of York; the EPPI-Centre at the Institute of Education at the University of London; Health Evidence Bulletins Wales; the ESRC UK Centre for Evidence Based Policy and Practice at Queen Mary College, University of London and its nodes at the City University London and the MRC Public Health Sciences Unit at the University of Glasgow; members of the Cochrane and Campbell collaborations; the United Kingdom and Ireland Public Health Evidence Group and the members of the Public Health Evidence Steering Group. This latter organisation acts as the overall guide for the evidence-building project of the HDA. The cooperation of colleagues in these institutions and organisations has been of significant help in the general work in preparing the framework for how we assess the evidence. The HDA is, however, responsible for the presentation and organisation of the material in the briefings.

We would also like to express our gratitude to the smoking evidence base reference group.

Every effort has been made to be as accurate and up-to-date as possible in the preparation of this briefing. However, we would be very pleased to hear from readers who would like to comment on the content or on any matters relating to the accuracy of the briefing. We will make every effort to correct any matters of fact in subsequent editions. Comments can be made by using our website www.hda.nhs.uk/evidence

Professor Michael P. Kelly
Director of Evidence and Guidance
Health Development Agency

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Summary

Introduction

This briefing (a review of reviews) aims to:

- Identify all relevant systematic reviews and meta-analyses
- Review these papers and highlight 'what works' to reduce smoking initiation and/or the further uptake of smoking, and to increase smoking cessation for all population groups, but with particular reference to disadvantaged and vulnerable groups
- Highlight conflicting evidence, gaps in the evidence and provide a steer for future policy and research commissioning.

This briefing also draws out any findings in relation to inequalities in health and the cost effectiveness of interventions.

The HDA has been commissioned by the Department of Health to develop the evidence base for the reduction of smoking. This briefing is also intended to inform policy and decision makers, NHS providers, public health physicians and other public health practitioners in the widest sense. The evidence presented here should be considered alongside other sources of evidence that may be helpful to inform policy and practice.

Smoking

Smoking has been identified as the principal reason for the inequalities in death rates between rich and poor in the UK (HDA and ASH, 2001). In addition, the importance of smoking as a public health issue has been highlighted in a number of key policy and strategy papers (Department of Health 1998a, 1999a, 2000a, 2000b; Acheson, 1998).

In 2001, 27% of adults aged 16 and over in England were cigarette smokers, with 28% of men and 25% of women reporting smoking cigarettes (Department of Health and Office for National Statistics, 2003). Cigarette smoking prevalence was highest among both men and women aged 20-24 years (38% and 35% respectively), and declined with increasing age (16% among men and 17% among women aged 60 and over). There was also a very marked social class gradient in cigarette smoking, with overall prevalence of 21% of non-manual workers and 32% of manual workers. It is also recognised that other disadvantaged and vulnerable groups at risk from smoking included pregnant women, young people, black and minority ethnic groups, people living in poverty and people with mental health problems.

The estimated number of deaths attributable to (in part) smoking in the UK was 121,700 for the year 1995 (80,400 for men and 41,300 for women). This included 46,500 deaths due to cancer (including 30,600 from lung cancer), 34,300 from respiratory disease and 40,300 due to heart and circulation disease. It is estimated that 66% of smokers in England want to give up smoking (Department of Health and Office for National Statistics, 2003).

Government commitment to smoking cessation services is demonstrated in the *Priorities and Planning Framework 2003-2006* (Department of Health, 2002), which includes performance targets for primary care trusts:

- Reduce the rate of smoking among groups of smokers
- Update primary care practice-based registers in order that patients with coronary heart disease (CHD) and diabetes continue to receive appropriate advice and treatment, and ensure practice-based registers and systematic treatment regimes cover the majority of patients at high risk of CHD, particularly those with

hypertension, diabetes and a body mass index (BMI) greater than 30

- Deliver 1% reduction per year in the proportion of women continuing to smoke throughout pregnancy.

Review methodology

The following process was applied:

- Systematic searching of all English language literature from January 1996 to November 2001
- Selection of relevant reviews
- Critical appraisal of the reviews according to HDA criteria of transparency, systematicity, quality and relevance
- Analysis and synthesis of the evidence for different topic areas and populations groups.

The process of critical appraisal identified 29 papers, which were compared and top-level findings collated and presented in four core themes:

- A Strategies to reduce initiation and/or further uptake of smoking among children and adolescents
- B Strategies to increase cessation among all smokers
- C Interventions targeted at pregnant women
- D Inequalities.

Evidence statements were produced for the first three core themes based on the following categories:

- **Evidence of effectiveness:** derived from systematic reviews and meta-analyses where the results were all in agreement
- **Currently, there is a lack of evidence of effectiveness:** applied to interventions in systematic reviews and meta-analyses which showed no current impact on outcomes
- **Conflicting evidence of effectiveness:** derived from systematic reviews and meta-analyses where the interpretation and conclusions of the papers were not in agreement.

Evidence on the effect on inequalities in health and on the cost effectiveness of the interventions are also presented where the data are available.

Findings

Listed below are all the review-level evidence statements demonstrating effectiveness for the various types of interventions and settings for the first three core themes. An overview of the findings for the fourth inequalities theme is also presented. Evidence review statements where there is currently a lack of review-level evidence and/or where there is conflicting evidence can be found under the relevant sub-headings in sections A and B of the findings.

A Strategies to reduce initiation and/or further uptake of smoking among children and adolescents

Settings

Community wide interventions

- There is review-level evidence to support the effectiveness of community wide interventions based on social learning theory/social influences approaches in preventing the uptake of smoking in young people.

School-based interventions

- There is review-level evidence that supports the continued use of school-based 'peer' or 'social-type' interventions in preventing smoking in children.

Types

Increasing the unit price of cigarettes

- There is review-level evidence demonstrating the effectiveness of increasing the price of cigarettes for reducing tobacco use prevalence and consumption among both adolescents and young adults.

Mass media campaigns

- There is review-level evidence that mass media campaigns are effective in reducing cigarette use prevalence in adolescents when combined with other interventions; however, the contribution of individual components to the overall effectiveness of these interventions cannot be attributed.
- There is review-level evidence that mass media campaigns either on their own or when combined with

a school-based programme are effective in preventing the uptake of smoking in young people.

Retail interventions

- There is review-level evidence to suggest that interventions with retailers can lead to decreases in the number of outlets selling cigarettes to young people.
- There is review-level evidence to suggest that active enforcement and/or multi-component educational strategies with retailers can lead to decreases in the number of outlets selling cigarettes to young people and are more effective in reducing illegal sales than simply providing retailers with information.
- There is review-level evidence to suggest that legislation alone is not sufficient to prevent tobacco sales to minors.
- There is review-level evidence that limiting sales of tobacco may have an effect on young people's perceptions of ease of access to cigarettes and on smoking behaviour.

B Strategies to increase cessation of smoking among all smokers

Settings

Clinical (clinician)

- There is review-level evidence that minimal contact (<3 minutes in a session) with a clinician (both physician and non-physicians) is effective at increasing abstinence rates. Increasing contact time (3-10 minutes) further increases effectiveness. The highest level of effectiveness of increasing abstinence rates occurs with high intensity contact (>10 minutes).
- There is review-level evidence that any contact time with a clinician (both physician and non-physicians) is effective at increasing abstinence rates in smokers. Effectiveness increases as total contact time increases, peaking at a total contact time of 31-90 minutes. Beyond 90 minutes total contact time there is no further increase in effectiveness in abstinence rates.
- There is review-level evidence that multiple sessions by a clinician (both physician and non-physicians) are effective at increasing abstinence rates in smokers. Effectiveness increases as the number of sessions increases, with more than eight sessions with a clinician producing the highest level of effectiveness.
- There is review-level evidence that interventions

delivered by physicians and non-physicians (psychologist, nurse, dentist or counsellor) are equally effective at increasing abstinence rates in smokers.

- There is review-level evidence that interventions delivered by one or more clinician types (physicians, nurses, dentists, dental hygienists, psychologists, pharmacists or health educators) are effective for increasing abstinence rates.
- There is review-level evidence that interventions composed of one format type or more are effective at increasing abstinence rates in smokers. Interventions using three or four format types were the most effective at increasing abstinence rates. Formats include self-help, proactive telephone counselling, group or individual counselling.
- There is review-level evidence that types of counselling and behavioural therapies are effective at increasing abstinence rates in smokers. The effective therapies are:
 - Providing support during a smoker's direct contact with a clinician (intra-treatment social support)
 - Intervening to increase social support in the smoker's environment (extra-treatment social support)
 - Providing practical counselling such as problem solving, skills training, relapse prevention or stress management.

Clinical (other)

- There is review-level evidence to suggest that the same smoking cessation interventions are effective for both men and women.
- There is review-level evidence that smoking cessation treatments can be effective across different black and minority ethnic groups.
- There is review-level evidence that a variety of smoking cessation treatments can be effective for older adults. These include counselling interventions, physician advice, buddy support programmes, age-tailored self-help materials, and proactive telephone counselling.

Healthcare professionals

- There is review-level evidence that brief advice from physicians is effective in promoting smoking cessation.
- There is review-level evidence to suggest that more intensive advice over minimal physician advice is effective in promoting smoking cessation.
- There is review-level evidence that interventions with

follow-up visits increase cessation rates.

- There is review-level evidence that smoking cessation advice and counselling given by nurses to their patients can be effective. Advice is a verbal instruction from the nurse to 'stop smoking' whether or not information is provided about the harmful effects of smoking.
- There is review-level evidence that both high-intensity and low-intensity nurse interventions are effective at increasing abstinence rates in smokers.
- There is review-level evidence that nurse-led interventions delivered as part of hospitalised cardiac rehabilitation are effective at increasing smoking cessation rates.
- There is review-level evidence to support nurse-led interventions in non-hospitalised non-cardiac smokers.
- There is review-level evidence to support the use of nurse-led interventions with repeated telephone contact to increase smoking cessation.

General practice

- There is review-level evidence that the provision of either brief advice or intensive advice in general practice significantly increases the odds of stopping smoking compared to providing no advice.
- There is review-level evidence that patient education and counselling on smoking/alcohol contribute to behaviour change for disease prevention. However, we are unable to disaggregate the different components of the intervention.

Types

Increasing the unit price of cigarettes

- There is review-level evidence that increasing the unit price of cigarettes is effective at stopping tobacco use, and this remains true for vulnerable groups, women and men, low-income groups and people with lower educational achievement. The interventions are legislation at the state or national level to raise tobacco excise tax.

Mass media

- There is review-level evidence that mass media campaigns combined with other interventions are effective at increasing tobacco use cessation.

Buddy systems

- There is review-level evidence that social support interventions ('buddy systems') delivered in smokers' clinics are effective at increasing smoking cessation.

Telephone counselling

- There is review-level evidence that proactive telephone counselling (where a counsellor initiates one or more calls to provide support in making an attempt to stop smoking or avoid relapse) helps smokers to quit.
- There is review-level evidence to suggest that reactive telephone counselling (where counselling is provided via helplines of varying nature including information, recorded messages or personal counselling plus self-help materials) increases the chances of smokers quitting.
- There is review-level evidence to suggest that telephone counselling as a follow-up to face-to-face counselling may lead to a small increase in success rates compared to face-to-face interventions alone.
- There is review-level evidence that telephone cessation support is effective in increasing smoking cessation when implemented with other interventions (eg other educational approaches, clinical therapies, or a combination) in both clinical and community settings. The minimum intervention with evidence of effectiveness identified is proactive telephone support combined with patient cessation materials.

Behavioural counselling

- There is review-level evidence that individual behavioural counselling interventions given outside routine clinical care by smoking cessation counsellors, including health educators and psychologists, assist smokers to quit.
- There is review-level evidence that group behaviour therapy programmes are better than self-help and other less intensive interventions in assisting smokers to quit.

Self-help

- There is review-level evidence that self-help material on its own may provide a small increase in quitting compared to no intervention.
- There is review-level evidence that self-help materials tailored for individual smokers are more effective in

assisting smokers to quit than those that are not tailored.

- There is review-level evidence to suggest that providing telephone counselling as a means of increasing the intensity of the intervention and providing a smokers' helpline in addition to written materials appear to increase quit rates.

Incentives

- There is review-level evidence to demonstrate that reducing out-of-pocket costs for effective cessation therapies increases both use of the effective therapy and patient cigarette use cessation.

C Interventions targeted at pregnant women

- There is review-level evidence that smoking cessation programmes in pregnancy appear to reduce smoking, low birth weight and pre-term birth.
- There is review-level evidence to demonstrate a positive effect for leaflet-based prenatal smoking cessation interventions, and these are likely to be cost effective if incorporated into routine service delivery.
- There is review-level evidence that tailoring intervention methods and addressing barriers to behavioural change and the concerns of pregnant women lead to a greater acceptance of interventions.
- There is review-level evidence that some population groups of pregnant women (namely white, married, young and educated pregnant smokers) are more likely to quit smoking without the aid of further interventions.

D Inequalities

Many of the review-level papers describe studies targeting low socio-economic, low education, high risk, vulnerable and ethnic minority groups. However, they did not address the differential effectiveness of interventions among these groups, or how much the different components of interventions affected them.

Gaps in the evidence base

Based on the findings reported in the HDA Evidence Base papers there are significant gaps in the review-level cessation of stopping smoking. The most pressing gaps and recommendations for research are set out as follows.

Inequalities and cost effectiveness

There is little review-level evidence on interventions to reduce smoking initiation and increase smoking cessation in relation to reducing health inequalities or assessing their cost effectiveness. What little data there is on interventions targeting specific socio-economic, ethnic or vulnerable groups is typically from the US.

Intervention design

Researchers must endeavour to use rigorous methods to ensure that outcomes reported are robust. To do this, they should only measure sustained rates of cessation, rather than point prevalence; follow-up should occur for at least six months and preferably for one year or more; and biochemical markers must be used to confirm smoking outcome.

Other research recommendations

Research recommendations (both primary and secondary, based on the authors' conclusions) are wide ranging on:

- Strategies to reduce initiation and/or further uptake of smoking among children and adolescents
- Strategies to increase cessation of smoking among all smokers
- Interventions targeted at pregnant women.

However, they include:

- Evaluating mass media prevention campaigns and their components (eg required intensity) to demonstrate their effectiveness on children and adolescents' initiation
- Identifying which components of multi-component interventions, including mass media campaigns, are most effective in increasing smoking cessation
- Further investigating effective interventions to prevent smoking relapse among pregnant women and women who have just given birth.

Introduction

The aims of this briefing (a review of reviews) are to:

- Identify all relevant systematic reviews and meta-analyses
- Review these papers and highlight ‘what works’ to reduce smoking initiation and/or the further uptake of smoking, and to increase smoking cessation for all population groups, but with particular reference to disadvantaged and vulnerable groups
- Highlight conflicting evidence, gaps in the evidence and provide a steer for future policy and research commissioning.

The HDA Evidence Base

Decisions about policy and practice in the public sector are increasingly driven by consideration of the best available evidence. The process of drawing together, analysing and synthesising evidence from research is a central principle of evidence-based practice. Typically, the process of reviewing an area of practice or intervention will include the production of a systematic review of effectiveness, a meta-analysis or some other review-level synthesis and interpretation of evidence from research.

As more reviews and meta-analyses are carried out across the spectrum of public health, there is an increasing need to map the areas that they cover, assess their quality, and to pull together any common findings about what works in particular areas to improve health and reduce health inequalities. The task of keeping abreast of such large amounts of information is now too difficult for any one person. Systematic reviews are able to condense this large amount of information, via a structured method, into summary documents.

The Health Development Agency (HDA) has taken on the task of mapping and synthesising the best available review-level evidence for the effectiveness of interventions to improve health and reduce health inequalities across priority areas of public health. This evidence briefing is part of the first set of publications from the project. Mapping and synthesis of review-level data will enable practitioners and policy makers to view the aggregate strength of the evidence in key areas, see clearly where review-level evidence is lacking, and inform the development and commissioning of future research and reviews.

Evidence briefings are essentially reviews of reviews, analysing the strengths and weaknesses at this level in a topics evidence base, identifying gaps in the evidence, analysing future primary and secondary research needs, and discussing the implications of findings for policy and practice. Each briefing has a free-standing summary that is published separately. The briefings are also published on and supported by the HDA Evidence Base website (www.hda.nhs.uk/evidence). The website will contain the latest edition of this briefing and the authors recommend that readers refer to the website to ensure they have the latest version. Access to the original reviews on which these briefings are based can also be found on the HDA Evidence Base website, when they are available. Evidence briefings are designed to be accessed by a variety of users including those simply looking for headline findings, those wanting complete and detailed syntheses, and those who need to track back to the original primary and secondary sources.

Providing comprehensive, up-to-date syntheses of the literature available in reviews is the chosen first step in a process of building the public health evidence base. As our programme of work continues, we will turn our attention to bringing into our evidence briefings work that does not usually find its way into systematic reviews.

Presently a three-tier structure underpins the HDA's work to develop the public health evidence base:

- A Public Health Evidence Steering Group (PHESG) with membership drawn from universities, public health and research and development divisions of the Department of Health, other government departments, public health practitioners, representatives of research funding bodies, the NHS Centre for Reviews and Dissemination, Cochrane and Campbell collaborations, the EPPI-Centre, and other UK and WHO representatives. The group is chaired by Professor Jim McEwen, emeritus professor of public health at the University of Glasgow, on behalf of the Chief Medical Officer for England. This overarching group advises on the broad strategic direction of the evidence base and has a remit to quality assure the processes developed by the HDA to construct the evidence base
- For each topic area covered (eg accidental injuries and low birth weight), there is a reference group. These report to the PHESG, and consist of key academics, practitioners and officials with expertise in the area. Reference groups control the content of the evidence base and guide the production of evidence briefings
- Finally, the HDA is working to establish a robust evaluation framework for the entire HDA evidence base project. This will include the formation of user panels, to guide and inform our priorities and work.

The next stage in the process is the development of practice advice, derived from the findings of the evidence briefings. This briefing does not contain advice or guidance for practice. Following the publication of this briefing, a similar process of mapping and synthesis, informed and reviewed by practitioner and research experts, will take place, leading to the production of practice-based advice and publications. Translating evidence into practice requires gathering evidence from all sources and combining it with political and social information, mindful of resource constraints, to develop learning that is passed on to practitioners. The HDA has piloted this process of evidence into practice in two topic areas (physical activity and the prevention of accidental injuries) (Kelly and Speller, 2003).

Who is this briefing for?

This briefing is intended to inform policy and decision makers, NHS providers, public health physicians and other public health practitioners in the widest sense. Further

work will be done to turn the summary of evidence presented here into advice for practice. The limitations of this briefing and the data on which it is based, and alternative sources of evidence that may be helpful to inform policy and practice, are set out below. This briefing does not draw on many other sources of evidence available, and as such, should not be used to provide specific advice for practice.

What is effectiveness?

In this briefing we use the term 'effectiveness' to describe demonstrable, intended effects on (usually quantitative) outcomes. However, the term is not uncontested. First, while 'demonstrable' effects, in this context, usually imply those that are statistically significant, in some situations – particularly where interventions require careful, long-term evaluation – this may be an ambitious definition. Second, in the UK at least there are some tensions between different kinds of outcome measures, depending on the focus of the study.

The appraisal system that we have used (see the critical appraisal tool, Appendix C) favours reviews that have a transparent and replicable data search, methodology and analysis. This means that systematic reviews of effectiveness and meta-analyses tend to be rated highest (if they are well conducted) because of their clear methodology, relative to literature or other non-systematic reviews. This is not to say that literature reviews cannot be counted as strong evidence – where review rationale, methodology and analytic techniques are clear, they are rated highly.

Note, however, that reviews are not always comparing the same thing – some reviews examine outcome data studies, others look at more prospective studies – so interpretation of what we have found is complicated by the state of the data pool. Equally, the reviews themselves sometimes make difficult or inappropriate comparisons between and across evaluation studies that examine different aspects of the problem.

Smoking

Smoking has been identified as the principal reason for the inequalities in death rates between rich and poor in the UK (Health Development Agency and Action on Smoking and Health, 2001). In addition, the importance of smoking as a public health issue has been highlighted in the government's white papers *Saving Lives: Our Healthier Nation* (Department of Health 1999a) and *Smoking Kills* (Department of Health, 1998a); *The NHS Cancer Plan* (Department of Health, 2000a), the *National Service Framework for CHD* (Department of Health, 2000b), and the *Independent Inquiry into Inequalities in Health Report* (Acheson, 1998).

In 2001, the General Household Survey (GHS) (Department of Health and Office for National Statistics, 2003) showed that 27% of adults aged 16 and over in England were cigarette smokers, with 28% of men and 25% of women reporting smoking cigarettes. Cigarette smoking prevalence was highest among both men and women aged 20-24 years (38% and 35% respectively), and declined with increasing age to 16% among men and 17% among women aged 60 and over. However, the 2001 figures also revealed that 66% of smokers in England wanted to give up smoking.

Statistics cited by the Department of Health and Office for National Statistics (2003) for the estimated number of deaths attributable (in part) to smoking in the UK was 121,700 for the year 1995 (80,400 for men and 41,300 for women). This included 46,500 deaths due to cancer (including 30,600 from lung cancer), 34,300 from respiratory disease and 40,300 due to heart and circulation disease.

The GHS showed that the prevalence of cigarette smoking changed little during the 1990s, with no consistent overall trend in cigarette smoking prevalence between 1990 and 2000 for men, with the proportion reporting cigarette smoking varying between 31% and 29%, while for women there was a decrease from 29% to 25%.

The GHS results (Department of Health and Office for National Statistics, 2003) showed a social class gradient in cigarette smoking. The overall prevalence was 21% of non-manual workers and 32% of manual workers. For men, the figures were 22% and 34% for non-manual and manual workers respectively, while for women the figures were 20% and 31% respectively.

In addition, the 1998 Health Survey for England (Erens and Primatesta, 1999) showed how cigarette smoking prevalence increased as household income decreased, with the age-standardised proportion who were smokers rising consistently from 21% for men and 18% for women in the highest income quintile to 42% for men and 37% for women in the lowest income quintile.

These social class differentials in smoking are reflected in the social gradients of deaths caused by smoking. In 1996, smoking accounted for over half the difference in risk of premature death among men between social classes (Jarvis and Wardle, 1999), while between 1991 and 1993 premature deaths from lung cancer were five times higher among men in unskilled manual work compared to those in professional occupations (Department of Health, 1998a).

Other disadvantaged and vulnerable groups at risk from smoking include pregnant women, young people, black and minority ethnic groups, people living in poverty and people with mental health problems:

- **Pregnant women** – surveys in England estimated the prevalence of smoking during pregnancy was between 18% and 27% for 1999/2000 (Department of Health, 2001; Owen and Penn, 1999). The GHS for 2001 showed that 19% of pregnant women smoked throughout pregnancy, and there is a strong age gradient with 39% of those aged under 20 smoking throughout pregnancy, declining to 12% of those aged 35 years and over (Department of Health and Office for National Statistics, 2003). Smoking was especially prevalent among women who were single, separated or divorced (55.5%); classed in social groups DE (52.2%); lived in rented local authority accommodation (57.3%); and who had left full-time education at 15 or 16 years old (52.9% and 42.7% respectively) (Owen and McNeill, 2001). The relationship between low birth weight and smoking cessation has been reviewed elsewhere (Bull et al., 2003)
- **Young people** – an estimated 10% of children aged 11-15 were regular smokers in 2002 (Department of Health and Office for National Statistics, 2003)
- **Black and minority ethnic groups** – cigarette smoking is generally less prevalent (for example 17% and 9% for Chinese men and women respectively, and 26% and 5% for Pakistani men and women respectively) than among the UK population as a whole

(27%). But the smoking rate among Bangladeshi men is particularly high (44%), especially among middle aged and older men (50% and 54% for those aged 35-54 and 55+ respectively). These groups of Bangladeshi men also chew tobacco products at high rates (26% overall, increasing with age), as do older Bangladeshi women (43% and 56% of women aged 35-54 and 55+ respectively) (Department of Health, 1999b)

- **People living in poverty** – traditional measures of social class tend to underplay the extent to which high smoking rates have not decreased in the poorest sections of society, with studies showing smoking levels remaining unchanged among the poorest groups and rising among lone mothers (Marsh and McKay, 1994; Dorsett and Marsh, 1998; Jarvis, 1998). In particular, lone parents living in rented accommodation and relying on social security benefits were found to have smoking levels in excess of 75% in one study (Dorsett and Marsh, 1998)
- **People with mental health problems** – smoking prevalence is significantly higher among people with mental health problems than among the general population. Prevalence is highest among those with a diagnosis of a psychotic disorder, and studies show that smoking rates are as high as 80% among schizophrenics (McNeill, 2001). Over 70% people with psychotic disorders who live in institutions smoke, including 52% who are heavy smokers (Meltzer et al., 1995).

The Department of Health is committed to smoking cessation services in the *Priorities and Planning Framework 2003-2006* (Department of Health, 2002), which includes these targets for primary care trusts to achieve in the next three years:

- Reduce the rate of smoking, contributing to the national targets of reducing the rate in manual groups from 32% in 1998 to 26% by 2010; and 800,000 smokers from all groups successfully quitting at the four week stage by 2006
- In primary care, update practice-based registers so that patients with CHD and diabetes continue to receive appropriate advice and treatment in line with National Service Framework standards and by March 2006, ensure practice-based registers and systematic treatment regimes, including appropriate advice on diet, physical activity and smoking, also cover the majority of patients at high risk of CHD, particularly those with hypertension, diabetes and a body mass index (BMI) greater than 30

- Deliver 1% reduction per year in the proportion of women continuing to smoke throughout pregnancy, focusing especially on smokers from disadvantaged groups, as a contribution to the national target to reduce by at least 10% the gap in mortality between 'routine and manual' groups and the population as a whole by 2010, starting with children under one year.

Methodological issues

At present, the systematic review is probably perceived to be the most robust and reliable marker of effectiveness, closely followed by a well designed meta-analysis. They are used heavily in clinical sciences to inform practice, and are generally well regarded when used appropriately. This briefing pulls together evidence from systematic reviews of effectiveness, meta-analyses and narrative or literature reviews – a good spectrum of all the review-level evidence in the area. Yet relying on this type and level of evidence to inform our conclusions about interventions to reduce smoking initiation and increase smoking cessation has some limitations, and it is important to consider them when making decisions about policy or practice.

Definitions of what constitutes 'good' quality evidence in mainstream public health have been inherited from medical and scientific paradigms, where the experimental evaluation of clinical efficacy is commonplace and often appropriate. Although there is an increasing use of these approaches that rely on traditional evidence hierarchies, they may not always be the most appropriate methods of assessing the impact of interventions to improve public health, nor in particular to assess the impact of interventions on health inequalities.

At review (rather than single study) level, meta-analyses and systematic reviews of effectiveness can be very powerful tools for demonstrating the impact (or lack of it) of an intervention. However, they rely heavily on controlled evaluation studies, and statistically measurable outcome variables. In contrast, reducing smoking initiation and increasing smoking cessation is highly complex and relational, and almost impossible to capture in terms of quantitative outcomes alone. Public health priorities often do not 'fit' easily into these types of study designs.

Within the field of public health smoking, randomised controlled trials (RCTs) can be difficult to design and may

not be appropriate for the chosen intervention. This is particularly the case for 'upstream interventions' that try to influence national/regional strategies or policies, or the wider environment. We acknowledge the contributions of evidence collected using a wide range of methods. As Brunner et al. (2001) comment: 'What is important is that the evidence is collated systematically, with transparent inclusion and exclusion criteria, with attention paid to the methodological quality of the work, and without prior assumptions about the findings being allowed to influence what evidence is considered.'

A second issue is that, while meta-analyses and systematic reviews (and sometimes, to a lesser extent, literature reviews) are well placed to make judgements about the strength of impact of an intervention, and the quality of the evaluation design, they tend not to examine the appropriateness or quality of an intervention itself, and certainly not in any robust or systematic manner. This can be a source of bias – an inappropriate intervention might have a strong impact on one quantifiable outcome measure, and therefore influence review conclusions, even though that outcome measure might not be the most appropriate or useful. In other words, there is a risk that inappropriate or ill-designed interventions can be given more weight than more suitable (and often more complex or long-term) interventions, because they may be simpler and quicker to evaluate, or because they can prove some effect relatively easily. However, in spite of these limitations, systematic reviews are still a powerful tool in certain circumstances, based as they are on principles of finding good and effective interventions, eliminating harmful interventions, and facilitating public accountability – principles that are important cornerstones to building the public health evidence base.

A third issue is that reviews tend to rely on data from certain types of evaluation design – most often experimental and quasi-experimental trials – so excluding a substantive amount of literature from their consideration. It is important to note that if this evidence briefing has uncovered no evidence to support a certain intervention or programme, it does not mean there is absolutely no evidence out there, just that we have found no evidence included in reviews that meet our criteria. Also, sometimes when studies find an intervention has not been effective, this does not necessarily lead to a conclusion that the intervention, per se, is ineffective. For example, the study may not have had adequate power to detect a small positive difference, but ruling the intervention as ineffective

is too judgemental, as future studies using the intervention, perhaps delivered by different individuals, may turn out to be effective. Certainly, 'closing doors' on interventions and labelling them as ineffective simply because of the small numbers of studies does not seem useful. In this briefing, such interventions are categorised as currently having a lack of review-level evidence.

There is also a recognised methodological problem when undertaking a review of reviews – that different reviews frequently include some of the same primary evidence. This would bias findings in favour of study results which occur more often in the individual reviews.

Another issue to consider is the methodology of the systematic reviews on which this briefing is based. A number of authors have appraised systematic review methodology and have questioned many of its underlying assumptions (Hammersley, 2001). One common criticism is publication bias:

- Papers that demonstrate effective outcomes are more likely to be submitted to journals
- Negative impacts may be omitted from papers
- 'Positive' papers are more likely to be published by journal editors
- 'Positive' papers are more likely to appear in systematic reviews
- Such papers are, therefore, more likely to appear in reviews of reviews.

At present, there are problems in trying to incorporate other types of evidence into our evidence briefings. In some areas, such as qualitative research, the thresholds as to what constitutes 'good' quality work are contested by different researchers. As yet there is no agreed method for systematically synthesising or reviewing such work, although there are a number of projects underway nationally and internationally to develop an appropriate methodology. Nor is there any clear or agreed method for combining non-traditional forms of evidence – such as that from qualitative research, action research, expert opinion and so on – with evidence from more traditional types of study to provide a more comprehensive assessment of the effectiveness of different interventions. For the time being, the HDA has taken a first step to pull together evidence from systematic reviews and meta-analyses, with an acknowledgement that this limits our data pool and may provide only partial answers to our research questions.

A final issue is that of time lag. Inevitably, if one relies on review-level data to gather information about effectiveness, some time – usually one or more years – will elapse between the publication of single studies, the subsequent examination of these single studies by reviewers, and the publication of their reviews. Because of the processes involved in carrying out meaningful, high quality research, this is to some extent inevitable, and it can be argued that the procedures that cause this delay – the need for publications to be peer-reviewed, the need for a body of work to build up before it can be reviewed and examined – help avoid publication or positive bias in review findings. It means that the reviews taken into account by this briefing will consider single studies with a cut-off date of at least one year before the most recent review. If one single study has been published in the meantime that alters common conceptions or consensus about reducing smoking initiation or increasing smoking cessation it will take a while for the findings of that single study to filter into this forum. We expect to revise and update this briefing annually, which should ensure that new review data are included swiftly.

In summary, the data presented in this evidence briefing – data from reviews – are only a partial answer to ‘what works’ with respect to the management of smoking. In using this briefing to inform practice or policy-making, there are a number of other sources of information and evidence that could usefully be taken into account. These include:

- Information from practice studies (eg practice databases, ‘promising practice’ case studies)
- Research studies that are often or usually excluded from systematic reviews and meta-analyses (eg definitive studies, non-controlled case studies, action research)
- Local data and project evaluations (local to your context and area)
- Expert and practitioner opinion
- Client opinion and experience.

Mapping, collating and making available data from these alternative sources will be a future priority for the HDA. In the meantime, the Public Health electronic Library (PHeL – www.phel.gov.uk) is a good starting point for the practitioner or policy maker seeking to take these other types of evidence into account.

Methodology

This briefing is based on findings from systematic reviews and meta-analyses of public health interventions to reduce smoking initiation and/or further uptake of smoking, and to increase smoking cessation. It does not assess the effectiveness of pharmacological treatments for smoking cessation, as this work is the remit of the National Institute for Clinical Excellence (NICE).

Identification of the relevant literature

An extensive and systematic search of the literature was conducted. The search strategy was devised in collaboration with the London Library and Information Development Unit (LLIDU). Examples of the search strategies are shown in Appendix A. Searches were conducted on the following electronic databases, websites and published sources:

CINAHL
Cochrane Library
DARE
EMBASE
MEDLINE
PsycINFO
Sociological Abstracts.

All databases were searched from January 1996 to November 2001, an arbitrary choice to make the analyses manageable. All citations were downloaded into Reference Manager software and any duplicates removed.

Data handling process

Titles and abstracts of identified references were independently assessed for relevance by two of the three reviewers (B. Naidoo and F. Gillson/J. Locker).

The following inclusion criteria were used:

- English language
- January 1996 to November 2001
- Human studies
- Systematic reviews and meta-analyses
- Public health and primary care interventions to reduce smoking initiation and increase smoking cessation.

For this first edition of the smoking evidence briefing, reviews were not included if the intervention had a pharmacological component; neither were interventions involving the training of health professionals, or interventions to reduce exposure to environment tobacco. However, these topics may be included in future editions of the evidence briefing.

Where no clear decision could be made on the basis of the title or abstract, studies were considered relevant. From this process a total of 119 papers thought to be relevant were ordered from the British Library, and 114 papers were retrieved within the timescale of this review.

All papers were assessed independently by two of three reviewers (B. Naidoo and F. Gillson/J. Locker) and critically appraised in terms of transparency, systematicity, quality and relevance according to the HDA Evidence Base methodology (Swann at al., 2003) (www.hda.nhs.uk/evidence/ebmanual_pqs.html).

These criteria are defined as follows:

- Transparency – is the review clear about the processes involved?
- Systematicity – does the review apply a consistent and comprehensive approach?

- Quality – are the appropriate methods and analyses undertaken?
- Relevance – is the review relevant to the UK’s priority populations?

There was no blinding of authorship of retrieved papers. A critical appraisal tool was used by each reviewer (Appendix B) and a joint decision made about a paper’s suitability for inclusion in the HDA Evidence Base. Disagreements were resolved through discussion or, if necessary, by recourse to a third reviewer.

Presentation of findings

The process of critical appraisal identified 29 HDA Evidence Base papers, which were compared and top-level findings collated. The findings are presented in four sections based on the core themes identified by the HDA reviewers:

- A Strategies to reduce initiation and/or further uptake of smoking among children and adolescents
- B Strategies to increase cessation of smoking among all smokers
- C Interventions targeted at pregnant women
- D Inequalities.

In sections A to C the papers that have passed the critical appraisal process are described in detail. A complementary table summarising the type of intervention, the number of studies and the geographical spread of the interventions included can be found in Appendix C. A number of evidence statements are made about whether certain interventions were effective, based on the evidence from the included HDA Evidence Base papers. Each summary statement could categorise the evidence as follows:

- **Evidence of effectiveness:** derived from systematic reviews and meta-analyses where the results were all in agreement
- **Currently, a lack of evidence of effectiveness:** applied to interventions in systematic reviews and meta-analyses which showed no current impact on outcomes
- **Conflicting evidence of effectiveness:** derived from systematic reviews and meta-analyses where the interpretation and conclusions of the papers were not in agreement.

A key remit of this briefing was to scrutinise the reviews for details on the effect on inequalities in health and on the cost effectiveness of the interventions. Many of the

reviews describe studies targeting low socio-economic, low education, high risk, vulnerable and ethnic minority groups. However, it should be noted they did not address the differential effectiveness of interventions among these groups, or how much the different components of interventions affected them – further details of which may be found in section D of the findings.

Furthermore, with respect to cost effectiveness, the majority of the papers do not include any of this type of information, while the studies that do are not consistent in how they approach their calculations, and little is known on the differential across the social gradient or within targeted groups. Where this information is available, this has been put into the relevant sections and is also reflected in the evidence statements.

Evidence Base papers

The following 29 review-level papers (ie systematic reviews and meta-analyses) met the criteria outlined in the Methodology section* and were included onto the HDA Evidence Base, which can be viewed at www.hda.nhs.uk/evidence

Abbot, N. C., Stead, L. F., White, A. R., Barnes, J. and Ernst, E. (2000). Hypnotherapy for smoking cessation. (Cochrane Review). In: *The Cochrane Library*, Issue 2, 2001. Oxford: Update Software.

Ashenden, R., Silagy, C. and Weller, D. (1997). A systematic review of the effectiveness of promoting lifestyle change in general practice. *Family Practice* 14 (2): 160-76.

Bains, N., Pickett, W. and Hoey, J. (1998). The use and impact of incentives in population-based smoking cessation programs: a review. *American Journal of Health Promotion* 12 (5): 307-20.

Fiore, M. C. (2000). US public health service clinical practice guideline: treating tobacco use and dependence. *Respiratory Care* 45 (10): 1200-62.

Hajek, P. and Stead, L. F. (2001). Aversive smoking for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.

Hopkins, D. P., Briss, P. A., Ricard, C. J., Husten, C. G., Carande-Kulis, V. G., Fielding, J. E., Alao, M. O., McKenna, J. W., Sharp, D. J., Harris, J. R., Woollery, T. A., and Harris, K. W. (2001). Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke. *American Journal of Preventive Medicine* 20 (Suppl 2): 16-66.

Kelley, K., Bond, R. and Abraham, C. (2001). Effective approaches to persuading pregnant women to quit smoking: a meta-analysis of intervention evaluation studies. *British Journal of Health Psychology* 6 (3): 207-28.

Lancaster, T. and Stead, L. F. (2001a). Individual behavioural counselling for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.

Lancaster, T. and Stead, L. F. (2001b). Self-help interventions for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.

Lichtenstein, E., Glasgow, R. E., Lando, H. A. and Ossip-Klein, D. J. (1996). Telephone counseling for smoking cessation: rationales and meta-analytic review of evidence. *Health Education Research* 11 (2): 243-57.

Lumley, J., Oliver, S. and Waters, E. (2000). Interventions for promoting smoking cessation during pregnancy (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.

May, S. and West, R. (2000). Do social support interventions ('buddy systems') aid smoking cessation? A review. *Tobacco Control* 9 (4): 415-22.

Mullen, P. D., Simons-Morton, D. G., Ramirez, G., Frankowski, R. F., Green, L. W. and Mains, D. A. (1997). A meta-analysis of trials evaluating patient education and counseling for three groups of preventive health behaviors. *Patient Education and Counseling* 32 (3): 157-73.

- Nishi, N., Jenicek, M. and Tataru, K. (1998). A meta-analytic review of the effect of exercise on smoking cessation. *Journal of Epidemiology* 8 (2): 79-84.
- Rice, V. H. (1999). Nursing intervention and smoking cessation: a meta-analysis. *Heart and Lung* 28 (6): 438-54.
- Rice, V. H. and Stead, L. F. (2000). Nursing interventions for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Rooney, B. L. and Murray, D. M. (1996). A meta-analysis of smoking prevention programs after adjustment for errors in the unit of analysis. *Health Education Quarterly* 23 (1): 48-64.
- Silagy, C. and Stead, L. (2000). Physician advice for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Sowden, A. J. and Arblaster, L. (2000). Mass media interventions for preventing smoking in young people. (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Sowden, A. and Arblaster, L. (2001). Community interventions for preventing smoking in young people. (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Stead, L. F. and Lancaster, T. (2000). A systematic review of interventions for preventing tobacco sales to minors. *Tobacco Control* 9 (2): 169-176.
- Stead, L. F. and Lancaster, T. (2001a). Telephone counselling for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Stead, L. F. and Lancaster, T. (2001b). Group behaviour therapy programmes for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Stead, L. F. and Lancaster, T. (2001c). Interventions for preventing tobacco sales to minors. (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Ussher, M. H. (2001). Exercise interventions for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- Ussher, M. H., Taylor, A. H., West, R. and McEwen, A. (2000). Does exercise aid smoking cessation? A systematic review. *Addiction* 95 (2): 199-208.
- White, A. R., Rampes, H. and Ernst, E. (2000). Acupuncture for smoking cessation (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2001. Oxford: Update Software.
- White, A. R., Resch, K. L. and Ernst, E. (1999). A meta-analysis of acupuncture techniques for smoking cessation. *Tobacco Control* 8 (4): 393-7.
- Windsor, R. A., Boyd, N. R. and Orleans, C. T. (1998). A meta-evaluation of smoking cessation intervention research among pregnant women: improving the science and art. *Health Education Research* 13 (3): 419-38.

* One review that may be regarded as a key omission is the Thorax guidelines (West et al., 2000). The Thorax paper was excluded at the critical appraisal stage using our strict inclusion criteria since it was limited to only reviewing Cochrane Reviews and lacked a detailed description of the appraisal of these reviews. However, all the Cochrane Reviews from the Thorax paper relating to the topics covered by this evidence briefing have been included, and our findings are in agreement with the Thorax paper. Full details of the guidelines can be found at the Thorax website: <http://thorax.bmjournals.com>

Note that several papers are Cochrane Reviews – the references here are for the versions current at the time of the literature search for this briefing. Some of these reviews cited have since been updated. The Cochrane Reviews database is now published by John Wiley & Sons, Chichester, and a full list of review titles is at: www.cochrane.org/cochrane/revabstr/mainindex.htm

Findings

This section is organised as follows:

Section A: Strategies to reduce initiation and/or further uptake of smoking among children and adolescents

Settings

- Community interventions
- School-based interventions

Types of intervention

- Increasing the unit price of cigarettes
- Mass media campaigns
- Retail interventions to prevent cigarette sales to minors

Section B: Strategies to increase cessation of smoking among all smokers

Settings

- Interventions in a clinical setting
- Physician-led interventions
- Nurse-led interventions
- General practice interventions

Types of intervention

- Increasing the unit price of cigarettes
- Mass media
- Buddy systems
- Telephone counselling
- Exercise
- Rapid aversive smoking
- Individual behavioural counselling
- Group behaviour therapies
- Self-help
- Acupuncture
- Hypnotherapy
- Incentives

Section C: Interventions targeted at pregnant women

Section D: Inequalities

Section A: Strategies to reduce initiation and/or further uptake of smoking among children and adolescents

Settings

Community wide interventions

Community interventions for preventing smoking in young people (Sowden and Arblaster, 2001)

The review identified 13 studies covering 14 different community interventions that met the authors' inclusion criteria. Inclusion criteria encompassed randomised and non-randomised controlled trials that assessed the effectiveness of multi-component community interventions compared to no intervention or to single component or school-based programmes only. Reported outcomes had to include smoking behaviour in young people under the age of 25 years.

Three studies were UK-based, nine were US-based and one was based in Finland. The participants varied across studies, some targeted young people in specific high-risk groups, which may be defined as living in deprived areas or because they attended a continuation high school.* In one study African-American children were targeted. The age of the studies participants ranged from 8 to 24 years.

Most of the included studies had some kind of theoretical basis, although the theories varied between studies, and three studies made no reference to any theoretical approach. The theories mentioned were social learning theory, social influence approaches, stages of change theory, communication theories, and community/organisational change theories.

Four of the 13 studies included interventions that contained components – mainly school-based curricular aimed specifically at young people – but which were part of a larger community wide programme to reduce cardiovascular disease. One study focused on smoking only and used a public policy initiative to prevent uptake and promote the cessation of smoking. Three studies focused exclusively on the prevention of the uptake of smoking in young people and five studies focused on the prevention/reduction of tobacco, alcohol and drug use.

* Continuation high school – an alternative school in the US for young people at risk of dropping out of school.

Of the 13 studies, all but two included a school-based component, which mainly involved taught lessons. The number of sessions given varied between five and 58. Sessions were taught by a variety of teachers, health educators or student peers. The use of some form of media activity was a common feature to eight of the studies; however, its intensity varied enormously between the studies. The duration and intensity of the studies varied from the shortest (three weeks) to the longest (intermittently over four years) and in some studies these factors were not specified.

The duration of follow-up at which smoking status was assessed varied from the end of the intervention, including six months after, one year after and 15 years after, although in some studies the follow-up period was not clear. Smoking behaviour was assessed in all studies by self-report, and was validated chemically in six studies by measuring alveolar carbon monoxide and/or saliva thiocyanate levels in two studies.

Of these 13 studies, nine compared community wide interventions with no intervention controls with two studies reporting a reduction in smoking prevalence in the intervention communities compared to the no-intervention controls. The remaining seven studies reported no effects of the intervention on smoking prevalence.

Of the remaining studies that compared a community intervention with other single component interventions (school-based only or media only), two studies reported a significant difference in smoking prevalence between the intervention and control groups and two studies found no differences between the groups.

The studies that reported differences in smoking between the intervention and control groups were based on social learning theory or the social influences approach. The authors also highlighted the difficulties in evaluating community based interventions due to the heterogeneity between studies in terms of interventions, communities, participants and outcome measurement. And they stressed that it was important to recognise that community programmes are influenced by local factors and so may be difficult to replicate exactly in other settings. However, the authors did conclude there was some limited support for the effectiveness of community interventions in helping prevent the uptake of smoking in young people. The authors identified the following characteristics that should be considered when planning community programmes:

- Programmes should build upon the effective elements of existing campaigns
- Programmes need to be flexible to address variability between communities
- Developmental work should be carried out with representative samples of the target audience to implement appropriate messages and activities
- Programme messages and activities should be guided by theoretical constructs
- Community activities need to reach the intended audience.

Evidence statement

There is review-level evidence to support the effectiveness of community wide interventions based on social learning theory/the social influences approach in preventing the uptake of smoking in young people. These community interventions included school-based activities and/or a mass media component and/or parent involvement and/or community action/activities (Sowden and Arblaster, 2001).

- Provision of training, modelling, rehearsal, and reinforcement of techniques to resist social pressures to smoke
- Training on resistance to smoking messages in advertisements and in the media
- Making a public commitment not to smoke.

The interventions also sometimes included drug-specific resistance skills, generic social skills enhancement, self-rewards to improve self-efficacy, cognitive strategies to improve self-efficacy, methods to cope with anxiety, communication enhancement, or assertiveness skills. On average, the interventions comprised eight to nine sessions.

Rooney and Murray identified that a follow-up period of one year after the intervention was optimal, but the length of time to follow-up varied from two to 20 months. A third of the interventions either did not use a validation measure to confirm self-reporting of smoking/smoking cessation or it was not reported. The remaining 67% used a 'bogus pipeline' to validate self-reported smoking status (a bogus pipeline is a fictitious instrument which is described as some type of lie detecting device by the experimenter (Jones and Sigall, 1971).

School-based interventions

A meta-analysis of smoking prevention programs after adjustment in errors in the unit of analysis (Rooney and Murray, 1996)

This meta-analysis identified 90 eligible studies involving 131 different school-based smoking prevention interventions. The studies were published between 1974 and 1991. The interventions were carried out with 6th to 12th grades (11-18 years old). The interventions were mostly US-based and targeted both male and female students. More than half of the interventions targeted groups of middle socio-economic status, and over 75% targeted white students. The meta-analysis authors defined the interventions as 'social' or 'peer-type'. These combine a variety of curricular components including:

- Information on the short-term health consequences of smoking
- Information on the social influences that encourage smoking
- Correction of students' normative expectations for smoking

The authors concluded that the results of the meta-analysis supported the continued use of 'peer' or 'social-type' (these terms are not defined by the authors) smoking prevention programmes. However, they state that the overall magnitude of effect for these programmes was likely to be quite limited, with the effect size translating to a 5% relative reduction in smoking, although the optimal effect size would be equivalent to a 19-29% reduction in smoking. They also conclude that the impact of 'peer' and 'social-type' programmes may be improved if:

- They are delivered early during the transition from elementary to middle school (ie 6th grade)
- Same-age peer leaders play a substantial role in delivering the programme
- They are part of a multi-component health programme
- Booster sessions are included in subsequent years
- Peers are not over-trained.

Evidence statement

There is review-level evidence that supports the continued use of school-based 'peer' or 'social-type' interventions in preventing smoking in children (Rooney and Murray, 1996).

Types of intervention

Increasing the unit price of cigarettes

Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke (Hopkins et al., 2001)

The aim of this systematic review was to summarise the effectiveness, applicability, other effects, economic evaluations and barriers to the use of selected population-based interventions intended to reduce exposure to environmental tobacco smoke (ETS), reduce tobacco use and increase tobacco use cessation.

Literature used for the review was published between 1980 and 2000.

The review is presented in three sections:

- 1 Strategies to reduce exposure to ETS (this covers smoking bans and restrictions, and community education to reduce exposure to ETS in the home)
- 2 Strategies to reduce tobacco use initiation (this covers increasing the unit price of cigarettes and mass media campaigns)
- 3 Strategies to increase tobacco use cessation (this covers increasing the unit price for cigarettes, mass media education [such as campaigns, cessation series and cessation contests], reactive telephone counselling and incentives).

This evidence briefing covers sections two and three of the above. Findings in relation to strategies to reduce tobacco use initiation (section A) are presented in detail immediately on pp20-22. The findings covering strategies to increase tobacco use cessation (section 3) are presented under the appropriate sub-headings (p33, p37, p46).

In the studies that involved measurement of tobacco use cessation the authors selected, where possible, effect measures of verified rather than self-reported cessation, and continuous cessation (duration usually of three or more months) over cessation of less than three months duration. No studies were excluded strictly on the basis of an insufficient follow-up period. Follow-up periods varied from four weeks to two years. Where additional information on the above follow-up periods and validation methods are available, they are included in any subsequent descriptions of Hopkins et al. (2001) work in this briefing.

Eight studies were identified on the effectiveness of increasing the price for tobacco products as a strategy to reduce tobacco use initiation and further uptake in children and adolescents. All of the studies were conducted in the US and employed econometric methods in analysing cross-sectional surveys. Five studies examined the effect of product price on tobacco use in adolescents aged 13-18 years and three studies looked at young adults aged 18-24 years. Five studies evaluated the effect of price for periods that included the 1990s, while three studies reported the period prior to 1990. Interventions covered included legislation at the state or national level to raise the product excise tax.

Seven of the eight studies reported that increasing tobacco prices was associated with reduced levels of tobacco use by adolescents and young people. One study did not find a statistically significant effect of price on adolescent tobacco use. For tobacco use prevalence the median result suggested that a 10% increase in product price would result in a 3.7% decrease in prevalence of tobacco use among adolescents. Similarly, the median result from six studies that provided measurements on tobacco consumption suggested that a 10% increase in product price would result in a 2.3% decrease in tobacco consumed by adolescent users. Importantly, some studies reported evidence of effectiveness on tobacco use and consumption among all ethnic groups studied, including vulnerable groups such as disadvantaged African-Americans and Hispanics.

The authors concluded that there was 'strong scientific evidence' that increasing the unit price of tobacco products reduces tobacco use prevalence and consumption in young adults and adolescents, including those from vulnerable groups.

Evidence statement

There is review-level evidence demonstrating the effectiveness of increasing the price of cigarettes for reducing tobacco use prevalence and consumption among both adolescents and young adults (Hopkins et al., 2001).

Mass media campaigns

Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke (Hopkins et al., 2001)

For general background information on Hopkins et al. (2001) refer to p20. In relation to the effectiveness of mass media campaigns Hopkins et al. (2001) identified 12 studies judged to be of sufficient design quality and execution. Ten studies were conducted in the US, one in Norway and one in Finland.

Campaigns were defined as an 'extended duration of brief recurring messages to inform and motivate individuals to remain tobacco free'. Formative research was used to develop the content of messages. These were delivered through paid broadcast time and print space, donated time and space (as public service announcements), or a combination of these. Most of the interventions (11 out of 12) also ran alongside increases in tax on tobacco products, school-based education or other community programmes. All 12 studies focused on adolescents.

All seven of the studies that evaluated campaigns of greater than two years duration observed a reduction in tobacco use prevalence in the intervention group when compared with controls (median of 2.4% lower). However, the contributions of individual components to the overall effectiveness of the interventions cannot be attributed. Specific US interventions also showed evidence of effectiveness across a broad spectrum of populations, including African-Americans and Hispanics.

Only one study provided cost-effectiveness data, but this provided information supporting the 'very good' cost effectiveness of this intervention. Each 'smoker averted' cost \$6,069 and the cost per quality adjusted life year (QALY) was \$333.

Mass media interventions for preventing smoking in young people (Sowden and Arblaster 2000)

This review was based on six studies that met the authors inclusion criteria. The studies were published between 1983 and 1997, with five conducted in the US and one in Norway. The study populations ranged in age from 10 to 18 years.

Three of the studies used mass media alone and three combined mass media with a schools-based educational component. The intensity (one to 13 weeks) and duration (15 months to four years) of the individual media campaigns varied greatly between the studies.

The duration of follow-up at which smoking status was assessed differed between the six studies (from one month up to two years) and in some cases was not clear. Smoking behaviour was assessed in all the studies by self-report and in one study was validated chemically using alveolar carbon monoxide and saliva thiocyanate levels. In three studies bogus pipelines were used as an addition to self-report. A bogus pipeline is a fictitious instrument which is described as some type of lie detecting device by the experimenter (Jones and Sigall, 1971).

Only one of the included studies, which involved broadcasting a media campaign, reported cost. The cost per student averted was \$754 and the cost per life-year gained, discounted at 3%, was \$696, which was reported to compare favourably with other preventive and therapeutic strategies.

Two out of the six studies were associated with reductions in smoking behaviour. One found that a mass media campaign was effective in influencing smoking behaviour compared to no intervention, and involved developing provocative messages that were used to cause affective personal reaction. The other study found that a mass media campaign combined with a school-based programme was more effective than a school-based programme alone, and involved developing a programme based on the social influence or social learning theory approaches. Both of these studies also found statistically significant differences between the intervention and control groups on immediate outcomes, such as attitudes to smoking, smoking norms and intentions to smoke in the future.

Both of the effective campaigns had a solid theoretical basis, used formative research in designing the campaign messages and the message broadcast was of a reasonable intensity over extensive periods of time.

The authors concluded that there is some evidence that media campaigns can be effective in preventing the uptake of smoking in young people. However, they stated that their review should be interpreted with caution due to the methodological limitations of primary

research in this area, such as the use of incorrect allocation, the incorrect level of analysis, the lack of proper follow-up and the lack of controls or equivalent controls.

Nevertheless, the authors identified the following characteristics that should be considered when planning future mass media campaigns:

- Campaigns should build on the effective elements of existing campaigns
- Developmental work should be carried out with representative samples of the target audience to create media messages appropriate to that group
- Campaign messages should be guided by theoretical concepts about behaviours
- Media messages need to reach the target audience using media channels preferred by the target audience at the most appropriate time
- For broadcasting campaigns to have a reasonable chance of being effective they should be of sufficient intensity, frequency and duration
- The preference of the target audience for either radio or television is likely to depend on age.

Evidence statements

There is review-level evidence that mass media campaigns are effective in reducing cigarette use prevalence in adolescents when combined with other interventions; however, the contribution of individual components to the overall effectiveness of these interventions cannot be attributed (Hopkins et al., 2001).

There is review-level evidence that mass media campaigns either on their own or when combined with a school-based programme are effective in preventing the uptake of smoking in young people (Sowden and Arblaster, 2000).

Retail interventions to prevent cigarette sales to minors

A systematic review of interventions for preventing tobacco sales to minors (Stead and Lancaster, 2000); Interventions for preventing tobacco sales to minors (Stead and Lancaster, 2001c)

Both these papers relate to the same piece of work (one is a journal article, the other a Cochrane Review). While the background information that follows is primarily drawn from the Cochrane Review, the evidence statements apply to both papers.

The authors identified 30 studies that met their inclusion criteria of evaluated strategies which targeted retailers to reduce tobacco use by minors (Stead and Lancaster, 2001c). Minors were defined by the legal age limit in the communities studied. The main interventions were education about legal requirements; notification of the results of compliance checks; warning of enforcement; and implementation of enforcement by police or health officials. In most of the studies, there was dissemination of information to retailers about their legal obligations, including reminders of the age at which purchase was legal, that proof of age should be required before sale, or that warning notices should be displayed. Usually this information was posted, but sometimes mass media channels were used.

Of the 30 studies, 13 used some form of control group. The remaining uncontrolled studies compared rates of illegal sales or smoking behaviour before and after an intervention. Three of the 30 studies were in the UK, 19 in the US, six in Australia and two in Canada.

Twenty-eight of the 30 studies assessed retailer compliance with the law using test purchasers. Most studies focused on 'over the counter sales' but some assessed ease of purchase from vending machines. Eight studies assessed the effect of an intervention on the smoking behaviour of underage youth. The three uncontrolled studies measured smoking behaviour before and after a change in enforcement practice. However, the authors do refer to methodological problems in evaluating retailer interventions. For example, assessment of retailer behaviour during compliance checks does not show whether smoking behaviour by minors has changed, or even how easy it is for them to buy tobacco. Of the 30 studies, 21 did not assess smoking behaviour

and of the remaining nine studies which did assess smoking behaviour no reference is made to the follow-up period or the mechanism used to assess smoking status, ie self-report or biochemical validation.

Eleven of the 13 controlled trials assessed whether interventions with retailers led to decreased sales to minors (measured using compliance checks). Six of these 11 studies found the intervention reduced illegal sales when compared to the control group. Three of these successful trials used active enforcement, while the other three were interventions without enforcement.

Seven studies also assessed whether reduced sales of tobacco to minors led to a reduction in minors' self-reported ease of access. Three out of these seven studies showed that the intervention was associated with decreased test sales.

In relation to reducing sales of tobacco to minors to decrease the prevalence of tobacco use, three out of five controlled trials found an effect of intervention on youth smoking behaviour. Two studies did not find evidence of change in smoking behaviour.

The authors concluded that interventions can be effective in reducing tobacco sales to minors by retailers. However, simply giving information to retailers was less effective in reducing illegal sales than active enforcement and/or multi-component educational strategies. Furthermore, legislation alone was not sufficient to prevent tobacco sales to minors. In addition, the authors found limited evidence for an effect of intervention on youth perceptions of ease of access to tobacco, and on smoking behaviour.

Evidence statements

There is review-level evidence to suggest that interventions with retailers can lead to decreases in the number of outlets selling cigarettes to young people.

There is review-level evidence to suggest that active enforcement and/or multi-component educational strategies with retailers can lead to decreases in the number of cigarettes to young people and are more effective than simply providing retailers with information.

There is review-level evidence to suggest that legislation alone is not sufficient to prevent tobacco sales to minors.

There is review-level evidence that may suggest an effect on young people's perception of ease of access to cigarettes or prevalence of smoking.

(Stead and Lancaster, 2000, 2001c)

Section B: Strategies to increase cessation of smoking among all smokers

Settings

Interventions in a clinical setting

US public health service clinical practice guideline: treating tobacco use and dependence (Fiore, 2000)

This review identified 6,000 articles published between 1975 and 1994 that were then screened and reviewed to identify a smaller subset of articles to serve as the basis for guideline data analyses, using primarily meta-analysis and expert panel opinion. The evidence gathered was used for the basis of guideline recommendations, with the strength of the evidence being rated across three categories:

- A Multiple, well-designed randomised clinical trials demonstrating consistent findings
- B Some evidence from randomised clinical trials
- C Expert panel consensus in the absence of relevant randomised clinical trials.

Although the details of the individual articles were not listed, the extent of the topics covered, the methodologies described and the number of researchers involved can be taken as an indication of a sound systematic review. The results of the relevant meta-analyses are summarised in the tables that follow.

Articles were included in the meta-analysis only if they provided follow-up results for at least five months after the quit date. The meta-analysis pooled studies both with and without biochemical confirmation of quitting – as Fiore’s previous analyses produced similar results whether or not the biochemical confirmation data were pooled.

Point prevalence data, taken one week before the time period, rather than continuous abstinence data, was used. This was because the data were typically presented in this way in the studies, and Fiore believed that point prevalence data at five months would have displayed the majority of relapse that was likely to happen.

Time length of clinician-person sessions

Fiore (2000) analysed interventions by session time length among clinicians (both physicians and non-physicians). Length was based on the maximum amount of time that the clinician spent with a smoker addressing tobacco dependence in a single session. Each intervention’s contact time was categorised as: minimal contact (<3 minutes), low intensity contact (3-10 minutes) and high intensity contact (>10 minutes). A dose-response relationship is shown between session lengths and abstinence rates, where greater intensity led to greater abstinence.

Total time of clinician-person sessions

Fiore (2000) analysed interventions by the total length of contact time spent with smokers by clinicians (both physicians and non-physicians). This was calculated from the number of sessions multiplied by the session length. Interventions were categorised as: no contact, 1-3 minutes, 4-30 minutes, 31-90 minutes, 91-300 minutes and greater than 300 minutes. Any contact time was significantly more effective at increasing abstinence than no contact time. A dose-response relationship is shown between the total amount of clinician contact time and abstinence rates. This dose-response is particularly evident between 1-3 minutes (abstinence rate of 14.4%) and 31-90 minutes (abstinence rate of 26.5 %). Beyond 90 minutes of contact time, abstinence rates did not increase further (25.5% abstinence with >300 minutes total contact time).

Review – Fiore, 2000 – Time length of clinician-person sessions		
Comparison	Outcome	OR (95% CI)
No contact	Abstinence	1.0
Minimal contact (< 3 min) versus no contact	Abstinence	1.3 (1.01, 1.6)
Low intensity contact (3-10 min) versus no contact	Abstinence	1.6 (1.2, 2.0)
High intensity contact (> 10 min) versus no contact	Abstinence	2.3 (2.0, 2.7)

Review – Fiore, 2000 – Total time of clinician-person sessions		
Comparison	Outcome	OR (95% CI)
No minutes	Abstinence	1.0
1-3 min contact time versus no contact	Abstinence	1.4 (1.1, 1.8)
4-30 min contact time versus no contact	Abstinence	1.9 (1.5, 2.3)
31-90 min contact time versus no contact	Abstinence	3.0 (2.3, 3.8)
91-300 min contact time versus no contact	Abstinence	3.2 (2.3, 4.6)
>300 min contact time versus no contact	Abstinence	2.8 (2.0, 3.9)

Review – Fiore, 2000 – Number of clinician-person sessions		
Comparison	Outcome	OR (95% CI)
0-1 sessions	Abstinence	1.0
2-3 sessions	Abstinence	1.4 (1.1, 1.7)
4-8 sessions	Abstinence	1.9 (1.6, 2.2)
>8 sessions	Abstinence	2.3 (2.1, 3.0)

Review – Fiore, 2000 – Type of clinician delivering an intervention		
Comparison	Outcome	OR (95% CI)
No clinician	Abstinence	1.0
Self-help	Abstinence	1.1 (0.9, 1.3)
Non-physician clinician	Abstinence	1.7 (1.3, 2.1)
Physician clinician	Abstinence	2.2 (1.5, 3.2)

Number of clinician-person sessions

Fiore (2000) analysed interventions by the number of sessions spent with smokers by clinicians (both physicians and non-physicians). Interventions were categorised as: zero or one session, two or three sessions, four to eight sessions, and greater than eight sessions. Multiple treatment sessions were significantly more effective at increasing abstinence than zero or one sessions. A dose-response relationship is shown between the number of sessions and abstinence rates, with abstinence rates being highest for interventions lasting eight or more sessions (24.7%).

Type of clinician delivering an intervention

Fiore (2000) analysed non-pharmacological interventions by the type of clinician carrying out the intervention. Interventions were categorised as: no clinician (no intervention), self-help (self-help materials only), non-physician clinician (psychologist, nurse, dentist or counsellor), and physician. Where interventions were delivered by physicians or non-physicians, effectiveness of increasing abstinence rates was significantly higher than compared with self-help or no clinician. There was no clear advantage to any clinician type with all types showing similar levels effectiveness.

Review – Fiore, 2000 – Number of types of clinician delivering an intervention		
Comparison	Outcome	OR (95% CI)
No clinician	Abstinence	1.0
Delivered by one clinician type	Abstinence	1.8 (1.5, 2.2)
Delivered by two clinician types	Abstinence	2.5 (1.9, 3.4)
Delivered by three clinician types	Abstinence	2.4 (2.1, 2.9)

Review – Fiore, 2000 – Number of format types used		
Comparison	Outcome	OR (95% CI)
No format	Abstinence	1.0
One format	Abstinence	1.5 (1.2, 1.8)
Two formats	Abstinence	1.9 (1.6, 2.2)
Three or four formats	Abstinence	2.5 (2.1, 3.0)

Number of types of clinicians delivering an intervention

Fiore (2000) analysed the effectiveness of interventions based on the number of types of clinicians involved in delivering the intervention. This reflected the number of different types of clinicians involved, not the number of total clinicians regardless of type. Interventions were delivered by a variety of clinicians including physicians, nurses, dentists, dental hygienists, psychologists, pharmacists and health educators. Interventions were categorised as: no clinician, one clinician type, two clinician types, three or more clinician types. Where interventions were delivered by multiple types of clinicians, effectiveness of increasing abstinence rates was significantly higher than interventions where there was no clinician. A non-significant trend for increasing abstinence rates when there were more types of clinicians involved was observed.

Number of format types used

Fiore (2000) analysed the effectiveness of interventions based on the number of format types used. Formats included self-help, proactive telephone counselling, group or individual counselling. Interventions were categorised as: no format (no intervention), one format, two formats, three or four formats. Interventions of one format or more were effective at increasing abstinence rates

compared with no intervention. Where interventions used three or four format types, effectiveness of increasing abstinence rates was significantly higher than interventions where fewer format types were used. A non-significant trend for increasing abstinence rates when there were more format types used was observed.

Types of counselling and behavioural therapies

Fiore (2000) analysed the effectiveness of interventions based on types of counselling and behavioural therapies used. It is important to note that most of these interventions were not carried out in isolation – they were typically a component of an intervention, as would be usual in a non-research setting. Types of counselling and behavioural therapies are listed in the table on p27. The types of counselling and behavioural therapies shown to be effective at increasing abstinence rates compared with no intervention were:

- Providing support during a smokers direct contact with a clinician (intra-treatment social support)
- Intervening to increase social support in the smoker's environment (extra-treatment social support)
- Providing practical counselling such as problem solving, skills training, relapse prevention, or stress management.

Review – Fiore, 2000 – Types of counselling and behavioural therapies		
Comparison	Outcome	OR (95% CI)
No counselling	Abstinence	1.0
Relaxation/breathing therapies	Abstinence	1.0 (0.7, 1.3)
Contingency contracting therapies	Abstinence	1.0 (0.7, 1.4)
Weight/diet therapies	Abstinence	1.0 (0.8, 1.3)
Cigarette fading therapies	Abstinence	1.1 (0.8, 1.5)
Negative affect therapies	Abstinence	1.2 (0.8, 1.9)
Intra-treatment social support therapies	Abstinence	1.3 (1.1, 1.6)
Extra-treatment social support therapies	Abstinence	1.5 (1.1, 2.1)
General problem solving therapies	Abstinence	1.5 (1.3, 1.8)

Gender

Fiore (2000) investigated whether men and women should receive different cessation interventions. The trials investigated revealed that the same non-pharmacological treatments benefit both men and women. Few studies investigated interventions targeted at a single gender and therefore it is difficult to determine whether any different barriers to treatment exist between men and women. Certainly a number of different barriers for women have been suggested – for example, different stressors, increased likelihood of depression, increased weight control concerns and hormonal cycles. Women considering pregnancy or who are pregnant are discussed in a separate section of this briefing (p47).

Black and minority ethnic groups

Fiore (2000) investigated whether treatments are equally effective across different black and minority ethnic groups. The evidence that black and minority ethnic groups often lack adequate access to primary care providers has suggested that special efforts and resources should be provided to meet the needs of these populations. Fiore (2000) reported that 'the trials carried out in US-based black and minority ethnic groups have demonstrated efficacy in using a variety of treatment methods, and these have not shown consistent evidence that targeted cessation programs result in higher quit rates in these groups than do generic interventions of comparable intensity. Moreover, smoking cessation

interventions developed for the general population have been effective with black and minority ethnic groups. Therefore, clinicians should offer treatments identified as effective to their patients from all black and minority ethnic groups. It is however essential that cessation counselling or self-help material be conveyed in a language understood by the smoker.'

Older adults

Fiore (2000) investigated whether treatments are equally effective for smokers over the age of 50. Smoking cessation interventions that have been shown to be effective in the general population have been shown to be effective with older smokers across a variety of treatment methods. These include counselling interventions, physician advice, buddy-support programmes, age-tailored self-help materials, and proactive telephone counselling (which is important as mobility may be an issue for some older people).

Evidence statements

There is review-level evidence that minimal contact (<3 minutes in a session) with a clinician (both physician and non-physicians) is effective at increasing abstinence rates. Increasing contact time (3-10 minutes) further increases effectiveness. The highest level of effectiveness of increasing abstinence rates occurs with high intensity contact (>10 minutes).

There is review-level evidence that any contact time with a clinician (both physician and non-physicians) is effective at increasing abstinence rates in smokers. Effectiveness increases as total contact time increases, peaking at a total contact time of 31-90 minutes. Beyond 90 minutes total contact time there is no further increase in effectiveness in abstinence rates.

There is review-level evidence that multiple sessions by a clinician (both physician and non-physicians) are effective at increasing abstinence rates in smokers. Effectiveness increases as the number of sessions increases, with greater than eight sessions with a clinician producing the highest level of effectiveness.

There is review-level evidence that interventions delivered by physicians and non-physicians (psychologist, nurse, dentist or counsellor) are equally effective at increasing abstinence rates in smokers.

There is review-level evidence that interventions delivered by one or more clinician types, (physician, nurses, dentists, dental hygienists, psychologists, pharmacists or health educators) are effective for increasing abstinence rates.

There is review-level evidence that interventions composed of one format type or more are effective at increasing abstinence rates in smokers. Interventions using three or four format types were the most effective at increasing abstinence rates. Formats include self-help, proactive telephone counselling, group or individual counselling.

There is review-level evidence that types of counselling and behavioural therapies are effective at increasing abstinence rates in smokers. The effective therapies are:

- Providing support during a smoker's direct contact with a clinician (intra-treatment social support)
- Intervening to increase social support in the smokers environment (extra-treatment social support)
- Providing practical counselling such as problem solving, skills training, relapse prevention or stress management.

There is review-level evidence to suggest that the same smoking cessation interventions are effective for both men and women.

There is review-level evidence that smoking cessation treatments can be effective across different black and minority ethnic groups.

There is review-level evidence that a variety of smoking cessation treatments can be effective for older adults. These include counselling interventions, physician advice, buddy-support programmes, age-tailored self-help materials, and proactive telephone counselling.

(Fiore, 2000).

Physician-led interventions

Physician advice for smoking cessation (Silagy and Stead, 2000)

The review identified 34 trials published between 1972 and 1999. The majority of trials were based in the UK, with other trials based in the US, Hong Kong, Sweden, Canada, Japan, Australia, Italy and France. Strict criteria were set for the outcome measures in this review. Only sustained rates of cessation, rather than point prevalence, were used. Follow-up was for at least six months and biochemical markers were used where available (13 out of 34 trials). Advice was a verbal instruction from the physician with a 'stop smoking' message irrespective of whether or not information was provided about the harmful effects of smoking. Minimal interventions were categorised as single consultations (with or without leaflet) lasting less than 20 minutes with up to one follow-up session. Any intervention providing more than this was categorised as intensive.

The pooled results of the 16 trials of brief physician advice versus no advice, or usual care, demonstrated a small but statistically significant increase in the odds of quitting (OR 1.69; 95% CI 1.45, 1.98).

In 15 trials comparing intensive and minimal physician advice, there was a small but significant advantage of more intensive advice (OR 2.11; 95% CI 1.74, 2.54) over no advice, although there was significant heterogeneity in the trials. For 10 trials in populations of smokers without smoking-related disease the impact of more intensive intervention was small, and only marginally significant. The use of aids (such as spirometry and carbon monoxide levels) combined with physician advice, compared to physician advice only, showed no additional effectiveness for the addition of aids (OR 0.61; 95% CI 0.26, 1.44).

A single trial provided insufficient evidence to support the benefits of motivational counselling compared to brief intervention on cessation rates (OR 2.0; 95% CI 0.59, 6.72). Interventions that included physician follow-up visits had a higher success rate for abstinence rates (OR 2.66; 95% CI 2.06, 3.45) when compared to no advice. Comparing

further physician follow-up to minimal physician advice showed a small increase in the odds of quitting (OR 1.60; 95% CI 1.10, 2.33).

The authors stated that the results of the review should be interpreted with caution due to methodological limitations such as publication bias, the meta-analysis being based on small studies, and the mixed methodological quality of the trials.

US public health service clinical practice guideline: treating tobacco use and dependence (Fiore, 2000)

For general information on Fiore (2000) refer to the section 'Interventions in a clinical setting' in Section B. Fiore (2000) also investigated minimal physician-led advice (<3 minutes) versus no advice and reached similar conclusions to Silagy and Stead (2000); that is, that physician advice to quit smoking is effective at increasing abstinence rates.

Evidence statements

Currently, there is a lack of review-level evidence to support the use of motivational counselling compared to brief interventions to increase cessation rates (Silagy and Stead, 2000).

Currently, there is a lack of review-level evidence to support the use of aids such as spirometry and carbon monoxide tests as an additional component of physician-led advice to increase cessation rates (Silagy and Stead, 2000).

There is review-level evidence that brief advice from physicians is effective in promoting smoking cessation (Silagy and Stead, 2000; Fiore, 2000).

There is review-level evidence to suggest that more intensive advice over minimal physician advice is effective in promoting smoking cessation (Silagy and Stead, 2000).

There is review-level evidence that follow-up visits increase cessation rates (Silagy and Stead, 2000).

Review – Fiore, 2000 – Physician advice		
Comparison	Outcome	OR (95% CI)
Physician advice versus no advice	Abstinence	1.3 (1.1, 1.6)

Nurse-led interventions

Nursing interventions and smoking cessation: a meta-analysis (Rice, 1999); Nursing interventions for smoking cessation (Rice and Stead, 2000)

Both these papers relate to the same piece of work (one is a journal article, the other a Cochrane Review). While the background information that follows is primarily drawn from the Cochrane Review the evidence statements apply to both papers.

Rice and Stead (2000) identified 22 trials that met the inclusion criteria, of which 18 studies were used in the meta-analysis. These trials were conducted between 1987 and 2000 and carried out in seven countries including the UK. Nursing intervention was defined as the provision of advice and/or other content and strategies to help patients quit smoking. Strict criteria were set down for the outcome measures in this review. Only sustained rates of cessation, rather than point prevalence, were used. Follow-up was for at least six months and biochemical markers were used where available (15 out of 18 trials). Advice was a verbal instruction from the nurse to 'stop smoking' whether or not information was provided about the harmful effects of smoking. Low-intensity interventions were defined as trials where advice was provided (with or without leaflet) during a single consultation lasting 10 minutes with up to one follow-up visit. High intensity was where the initial contact lasted more than 10 minutes, there were additional materials such as manuals or strategies (often beyond simple leaflets) and usually more than one follow-up visit.

All interventions

The overall finding, when considering all of the intervention studies as a whole, was that smoking cessation interventions delivered by nurses were effective for increasing smoking abstinence at six months or longer when compared to smokers without a nurse intervention (OR 1.50; 95% CI 1.29, 1.73). This was found to be consistent across different intensities of intervention, settings, and in smokers with or without smoking-related illnesses.

Effect of differing health states and client settings

Three trials that included smoking cessation interventions from a nurse as part of hospitalised cardiac rehabilitation were effective (OR 2.14; 95% CI 1.39, 3.31). One trial among non-hospitalised adults with cardiovascular

disease showed no evidence of an effect (OR 0.19; 95% CI 0.08, 0.46).

Interventions aimed at hospitalised non-cardiac smokers had no effect at increasing abstinence rates (OR 1.20; 95% CI 0.92, 1.56). However, eight trials in non-hospitalised non-cardiac adults showed an estimated 80% increase in the odds of success (OR 1.81; 95% CI 1.39, 2.36).

Effects of additional telephone support

In one trial using repeated telephone support the rate of abstinence increased (OR 1.40; 95% CI 1.00, 1.96).

Intensity of interventions

When comparing high-intensity nurse interventions with a control, these interventions were effective at increasing abstinence rates in smokers (OR 1.47; 95% CI 1.26, 1.72), as were low-intensity interventions (OR 1.67; 95% CI 1.14, 2.45). However, using an indirect comparison between high-intensity and low-intensity interventions, there was no evidence that interventions classified as higher intensity were more effective in achieving successful quitting than low-intensity interventions.

Use of physiological feedback

Two trials that evaluated the effect of physiological feedback (in the form of spirometry and demonstrated carbon monoxide levels) as an adjunct to nurse interventions showed little effect (OR 0.79; 95% CI 0.44, 1.44).

The authors stated that the results of the meta-analysis should be viewed carefully due to methodological limitations such as publication bias, small study size and differences in baseline cigarette use between studies. There was heterogeneity of studies, although the pooling of the results using a random effects model did not alter the estimate of the effect for the main finding.

Rice's earlier (1999) review demonstrated similar results and came to similar conclusions. It was based on 19 randomised clinical trials that were conducted between 1987 and 1998 in seven countries, including six in the UK. Of these 19 trials, 15 were used in the main comparison of nursing interventions versus controls.

Evidence statements

There is review-level evidence that smoking cessation advice and counselling given by nurses to their patients can be effective. Advice is a verbal instruction from the nurse to 'stop smoking' whether or not information is provided about the harmful effects of smoking.

There is review-level evidence that both high-intensity and low-intensity nurse interventions are effective at increasing abstinence rates in smokers. Low-intensity interventions are where advice was provided (with or without leaflet) during a single consultation lasting 10 minutes with up to one follow-up visit. High intensity is where the initial contact lasted more than 10 minutes, there were additional materials such as manuals or strategies (often beyond simple leaflets) and usually more than one follow-up visit.

Currently, there is a lack of review-level evidence to support the use of high-intensity interventions over low-intensity interventions, as both are currently equally effective.

There is review-level evidence that nurse-led interventions delivered as part of hospitalised cardiac rehabilitation are effective at increasing smoking cessation rates.

Currently, there is a lack of review-level evidence to support the use of nurse-led interventions aimed at non-hospitalised adults with cardiovascular disease.

Currently, there is a lack of review-level evidence to support the use of nurse-led interventions aimed at hospitalised non-cardiac smokers.

There is review-level evidence to support nurse-led interventions in non-hospitalised non-cardiac smokers.

There is review-level evidence to support the use of nurse-led interventions with repeated telephone contact to increase smoking cessation.

Currently, there is a lack of review-level evidence to support the use of nurse-led interventions that use physiological feedback (spirometry and carbon monoxide data) as a method to increase smoking cessation.

(Rice, 1999; Rice and Stead, 2000)

General practice interventions

The effectiveness of promoting lifestyle change in general practice (Ashenden et al., 1997)

This systematic review of smoking interventions in general practice included 23 trials in the analysis. The trials were conducted between 1972 and 1995, with follow-up periods ranging from six months to three years. Biochemical validation of outcomes was not reported. Most of the trials recruited people from the general population of smokers rather than specific groups, and covered a broad age range of adult smokers. Most interventions included verbal advice from the GP about smoking cessation, combined with supporting written advice. There was a mix of interventions involving a GP only and a GP plus another health professional. Brief advice was defined as advice given within the confines of a single consultation. Intensive advice involved more than a single consultation.

The provision of either brief advice (OR 1.27; 95% CI 1.11, 1.45) or intensive advice (OR 1.46; 95% CI 1.18, 1.80) in general practice significantly increased the odds of stopping smoking compared to providing no advice. However, there was no significant difference in the odds of quitting smoking when comparing intensive with brief advice in general practice (OR 1.07; 95% CI 0.88, 1.29).

A meta-analysis of trials evaluating patient education and counselling for three groups of preventive health behaviours (Mullen et al., 1997)

The objective of the meta-analysis was to examine the overall effectiveness of patient education and counselling for preventive health behaviours, and the effect of various approaches for modifying specific types of behaviours, which included smoking/cessation and alcohol misuse as well as nutrition and weight control, seatbelt use, exercise and breast self-examination.

The analysis included 39 studies on smoking/alcohol, 35 of which were on smoking/cessation. The final regression model included 37 studies to produce a homogeneous sample. However, there is a lack of detail on either the length of follow-up or the use of biochemical validation of smoking cessation status.

Characteristics of smoking/alcohol interventions that significantly influenced study outcomes included self-

monitoring of smoking cessation, using a general behaviour orientation (the authors do not define this) and media to support personal communication. In addition, self-monitoring appeared to add to the effectiveness of other behavioural techniques.

Overall the analysis indicated that patient education and counselling on smoking/alcohol did contribute to behaviour change for disease prevention, and estimated a 44% improvement in the experimental group compared to the control group.

Evidence statements

There is review-level evidence that the provision of either brief advice or intensive advice in general practice significantly increases the odds of stopping smoking compared to providing no advice. Brief advice is given within the confines of a single consultation and intensive advice involved more than a single consultation (Ashenden et al., 1997).

Currently, there is a lack of review-level evidence to support the use of high-intensity GP-led interventions over low-intensity GP-led interventions as they are equally effective (Ashenden et al., 1997).

There is review-level evidence that patient education and counselling on smoking/alcohol contribute to behaviour change for disease prevention. However, we are unable to disaggregate the different components of the intervention (Mullen et al., 1997).

Types of intervention

Increasing the unit price of cigarettes

Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke (Hopkins et al., 2001)

For background information on Hopkins et al. (2001) refer to p20.

Interventions on increasing the unit price of tobacco and the effect this had on stopping tobacco use included legislation at the state or national level to raise the product excise tax. Seventeen qualifying studies addressed this question, carried out in the US, Canada, UK (three studies), Austria, Finland, Switzerland and New Zealand. Regardless of what was used as an outcome measure (demand, population consumption, tobacco sales, individual responses and quantity consumed) the review reported that there was 'strong scientific evidence' that increasing tobacco prices was associated with reduced levels of tobacco use. The evidence was also consistent regardless of the setting, time period or differences in the control of potential confounders. The median result from 10 studies with respect to population consumption showed that for each 10% increase in price, a 4.1% decrease in prevalence of tobacco use occurred. Similarly, the median result from three more recent US studies in the 1990s showed that for each 10% increase in price, there was a 4% decrease in tobacco sales.

Importantly, some studies reported evidence of effectiveness on tobacco use and consumption among all ethnic groups (including vulnerable groups such as disadvantaged African-Americans and Hispanics), women and men, low-income groups and people with lower educational achievement.

Evidence statement

There is review-level evidence that increasing the unit price of cigarettes is effective at stopping tobacco use, and this remains true for vulnerable groups, women and men, low-income groups and people with lower educational achievement. The interventions are legislation at the state or national level to raise tobacco excise tax (Hopkins et al., 2001).

Mass media education

Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke (Hopkins et al., 2001)

For background information on Hopkins et al. (2001) refer to p20. The review identified three subtypes of mass media interventions (campaigns, cessation series and cessation contests). Each intervention is addressed separately as follows.

Campaigns

Hopkins et al. (2001) considered the question of the effectiveness of mass media campaigns to inform and motivate smokers to quit.

Campaigns occur for an extended duration using brief recurring messages to inform and motivate smokers to quit. Formative research was used to develop the content of messages. Messages were delivered through paid broadcast time and print space, donated time and space (as public service announcements), or a combination of these. All of the interventions also ran alongside increases in tax on tobacco products, community based education programmes, individual or group counselling for cardiovascular risk factor reduction and other mass media efforts. The 15 included studies were carried out in the US, Scotland, Finland and Australia.

A variety of outcome measures (individual tobacco use cessation, population consumption, prevalence of tobacco use) were reported, but regardless of which outcome measure was analysed, there was 'strong scientific evidence' that mass media campaigns reduced levels of tobacco use. Cessation rates in the intervention groups ranged from 3.9% (confirmed) to 50% (self-reported) with a median of 7% in follow-up periods of six months to five years (the median follow-up period was 14 months). The absolute percentage difference in cessation between intervention groups and control groups was a median of 2.2%. Importantly, some US studies reported evidence of effectiveness on tobacco use among ethnic groups (including vulnerable groups such as disadvantaged Hispanics and Vietnamese men).

Several studies also observed increases in the use of telephone cessation services when the mass media campaigns directed viewers to call for further information or support.

Two studies showed 'satisfactory' cost effectiveness of each intervention, with the cost per quitter ranging from \$796 to \$1,593 in one study to \$298 to \$655 in the other. Adjusted programme costs per QALY ranged from \$151 to \$328.

Cessation series

Hopkins et al. (2001) investigated the effectiveness of mass media cessation series to recruit, inform and motivate tobacco product users to start and maintain cessation efforts. Cessation series use recurring instructional sequences over several weeks or months and can be coordinated with pre-series broadcasts or print promotion, community education and organisation of community cessation groups. Formative research was used to develop the content of messages. Messages were delivered nightly or weekly on news or informational broadcasts that provided expert advice or peer-group experiences on a variety of cessation issues.

There was 'insufficient evidence of effectiveness' that mass media cessation series reduced levels of tobacco use. Cessation rates in the intervention groups were inconsistent across the studies and there were inadequacies in the comparison populations used.

Cessation contests

Hopkins et al (2001) investigated the effectiveness of mass media cessation contests to promote, recruit and motivate tobacco product users to participate in a targeted cessation date or period. Cessation contests are short duration community wide events that use mass media and usually include additional incentives for participation and successful cessation. The one included study ran in New York City and had a 13% participation rate, with a six-month self-reported absolute increase in cessation of 3.3% compared with smokers who received only general health education materials.

However, the review authors commented there was 'insufficient evidence of effectiveness' from the one included study that mass media cessation contests increased tobacco use cessation due to the small number of qualifying studies.

The use and impact of incentives in population-based smoking cessation programs: a review (Bains et al., 1998)

Bains et al. (1998) included 17 articles published between 1975 and 1997 that assessed the effectiveness of population-based cessation programmes involving incentives and the majority employed a contest approach. Most of the studies reviewed were US-based; others were from Finland, Sweden, Estonia, Australia, Canada and the UK. Smokers in the community pledged to quit smoking for a specified number of days in exchange for the chance to win prizes in a lottery draw.

Follow-up varied greatly from one month to one year. Only three studies were based on biochemical validation of smoking status.

Because of the generally low recruitment rates (usually 1-2% of smokers in the target population), the authors estimated that incentive-based programmes could expect at most 1% of their smokers to quit smoking. Within the populations recruited, however, quit rates ranged from 13% to 45%. However, the authors noted that most existing evaluations of population-based programmes are limited by weak, non-experimental study design, with only five of the studies reviewed comparing the quit rates among contest participants with non-participants. The authors also noted that contests may attract only smokers already motivated to quit and therefore positive results attributed to these contests may reflect a trend that would have occurred anyway.

No specific type of recruitment strategy or incentive was shown to be consistently more effective than others. Methodological differences among the studies made them difficult to compare and interpret and the authors concluded that practitioners who implement such an approach would see 'modest results' from such contests.

The authors conclude that the estimate of the cost for quitters ranged from less than \$20 to over \$400.

Evidence statements

There is review-level evidence that mass media campaigns combined with other interventions are effective at increasing tobacco use cessation.

Campaigns ran for an extended duration using brief recurring messages to inform and motivate smokers to quit and were delivered through paid broadcast time and print space, donated time and space (as public service announcements), or a combination of these (Hopkins et al., 2001).

Currently, there is a lack of review-level evidence to support the use of mass media cessation series in reducing cigarette use. Cessation series are mass media interventions that use recurring instructional segments, such as nightly or weekly segments on news or informational broadcasts, which recruit, inform and motivate cigarette smokers to initiate and maintain cessation efforts. These series can vary in time span from several weeks to several months (Hopkins et al., 2001; Bains et al., 1998).

Currently, there is a lack of review-level evidence to support the use of mass media cessation contests to increase tobacco use cessation. Cessation contests are short duration community wide events that use mass media, and usually include additional incentives for participation and successful cessation (Hopkins et al., 2001).

Buddy systems

Do social support interventions ('buddy systems') aid smoking cessation? A review (May and West, 2000)

May and West (2000) investigated whether social support interventions such as buddy systems aid smoking cessation. The review identified 10 studies for inclusion, published between 1984 and 1998. Of these, eight were clinic-based, one was based in a general practice clinic, and one was a community based intervention. A 'buddy' is provided with advice to support the smoker in his or her attempt to stop smoking. They are usually a partner, family member or friend, but sometimes it is someone previously unknown. Such interventions were typically delivered within group sessions with multiple quitters and buddies attending.

The authors reported that many of the studies had design flaws that were likely to affect the results, such as small sample sizes, not using complete abstinence as a smoking outcome and not chemically validating smoking status.

Overall, the authors concluded that results of buddy interventions on smoking were 'not impressive', although this may partly be due to poor research design. Positive results that buddies may be of some benefit were identified when interventions were delivered within smoking clinics (based on two studies, both with samples of over 100). At a community level, there was no strong experimental evidence that smokers attempting to quit on their own would benefit from the support of a family member or friend, even though social support has previously been correlated with success in stopping smoking.

Evidence statements

There is review-level evidence that social support interventions ('buddy systems') delivered in smokers' clinics is effective at increasing smoking cessation. A 'buddy' (usually partner, family member or friend) supports the smoker in his or her attempt to stop smoking and usually attends group cessation sessions with the smoker.

Currently, there is a lack of review-level evidence supporting the effectiveness of social support interventions ('buddy systems') in community interventions to increase smoking cessation.

(May and West, 2000)

Telephone counselling

Telephone counselling for smoking cessation: rationales and meta-analytic review of evidence (Lichtenstein et al., 1996)

The meta-analysis of the efficacy of proactive telephone counselling (where a counsellor initiates one or more calls to provide support in making an attempt to stop smoking or avoid relapse) initially identified 13 studies published between 1990 and 1996. Of these, 11 were used to evaluate the short-term (3-6 months) effects and nine

Review – Lichtenstein et al., 1996 – Telephone counselling		
Comparison	Outcome	OR (95% CI)
Telephone counselling versus control	Short-term cessation	1.34 (1.19, 1.51)
Telephone counselling versus control	Long-term cessation	1.20 (1.06, 1.37)

were used to evaluate the longer-term (12-18 months) effects. The number and timing of the phone calls in the studies cited differed significantly. No details were given regarding the biochemical validation of self-reported smoking cessation.

It was difficult to estimate the impact of reactive telephone counselling (where counselling is provided via helplines of varying nature including information, recorded messages or personal counselling) since few studies used control groups due to the nature of the intervention. However, one large controlled trial that was identified did show a positive effect.

The authors concluded that over a variety of settings proactive counselling showed consistent benefit in the short term, although the long-term effects were less consistent. But for reactive counselling the results from one large, well-controlled trial were optimistic and showed that it was likely to be cost effective, as well as appearing to be a useful public health smoking control strategy for large populations. However, for both proactive and reactive counselling the authors stated that there was a need for additional research on both their efficacy and cost effectiveness across different populations.

Telephone counselling for smoking cessation (Stead and Lancaster, 2001a)

Stead and Lancaster (2001a) identified 23 controlled studies that met the inclusion criteria, which included a follow-up of at least six months from the start of the intervention. Of these studies, 19 used proactive counselling calls, three assessed reactive counselling, and one trial compared two variants of telephone support as part of an intervention for hospital inpatients. The majority of studies were carried out in the US, with a few trials from Australia and Canada, but none from the UK. In nine trials no biochemical validation was attempted, and of those that used a biochemical validation not all reported validated quit rates.

Proactive telephone counselling

Proactive telephone counselling is where a counsellor initiates one or more calls to provide support in making an attempt to stop smoking or avoid relapse. The minimum intervention tested by Stead and Lancaster (2001a) was a single call offering stage-based counselling lasting about six minutes. The most common intervention was for three calls, generally spread over three months, with at least one call within the first month.

Overall, the findings provided support for the effectiveness of proactive telephone counselling. However, the authors stated that conclusions should be viewed with caution due to the heterogeneity of the studies, although they pointed out that their analysis was likely to be conservative.

Proactive telephone counselling plus face-to-face interventions showed no significant increase in quitting compared to face-to-face interventions alone (OR 1.08; 95% CI 0.87, 1.34). Neither was there a statistically significant effect of proactive telephone counselling plus nicotine replacement therapy when compared to nicotine replacement therapy alone (OR 1.08; 95% CI 0.82, 1.43). Other forms of proactive counselling do not appear to be significant in leading to an increase in smoking cessation.

Reactive telephone counselling

Reactive telephone counselling is where counselling is provided via helplines of varying nature including information, recorded messages or personal counselling. Three studies evaluating the effectiveness of helplines plus self-help materials versus self-help materials alone were unequivocal in their findings in that quit rates were higher in those using helplines plus self-help materials (OR 1.74; 95% CI 1.12, 2.69), although the exact nature of intervention differed. However, two further studies investigating the effect of tailored responses to calls to helplines failed to detect a significant increased benefit (OR 1.12). Other forms of reactive counselling do not appear to be significant in leading to an increase in smoking cessation. For full details please refer to Tables 1 to 3, Appendix D.

Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke (Hopkins et al., 2001)

For background information on Hopkins et al. (2001) refer to p20. The findings for multi-component interventions that included patient telephone support were based on 32 studies judged to be of sufficient design quality and execution, and of these 30 reported 31 measurements of differences in patient tobacco use cessation. The follow-up periods for these studies ranged from five weeks to 34 months, with a median of 12 months. The populations included hospitalised smokers, veterans, pregnant women, African-Americans and older (60+ years) smokers. No details were given on the biochemical validation of reported cessation.

Overall, the findings showed that the median difference was a 41% improvement in quit rates when compared to smokers who did not receive telephone counselling, and that telephone support was most effective when combined with other efforts, such as different educational approaches or medical therapies. Effective programmes should give cigarette smokers the option to call for help and should distribute printed materials about quitting cigarette smoking. Furthermore, telephone support was effective in helping smokers to quit when implemented in both clinical and community settings, when combined with other efforts.

Two of the studies reported the programme costs per quitter (in this case interventions to increase tobacco use cessation among pregnant women). The adjusted programmes cost per quitter were \$292 and \$677 for the two studies. The difference in programme cost between the two studies can be explained by the level of the intervention and the use of more resources.

Additionally, three studies reported the programme costs in terms of life years saved, of which two looked at interventions conducted in hospital settings with adult patients who smoked. These costs were calculated at \$1,248 and \$2,532 per QALY. The remaining study was based in a hospital setting with patients who had had an acute myocardial infarction and included telephone counselling after discharge. The adjusted programme cost per QALY was \$73 and included the cost of personnel and instructional materials but did not include time spent on the phone, programme development or training costs.

US public health service clinical practice guideline: treating tobacco use and dependence (Fiore, 2000)

For general background information on Fiore (2000) refer to p24. Smoking cessation interventions delivered by means of proactive telephone counselling/contact were analysed as part of analysis comparing different types of format (such as counselling) relative to no intervention. Fiore (2000) found that proactive telephone counselling was more effective than no intervention (OR 1.2; 95% CI:1.1, 1.4).

Evidence statements

There is review-level evidence that proactive telephone counselling (where a counsellor initiates one or more calls to provide support in making an attempt to stop smoking or avoid relapse) helps smokers to quit (Stead and Lancaster, 2001a; Lichtenstein et al., 1996; Fiore, 2000).

There is review-level evidence to suggest that reactive telephone counselling (where counselling is provided via helplines of varying nature including information, recorded messages or personal counselling plus self-help materials) increases the chances of smokers quitting (Stead and Lancaster, 2001a; Lichtenstein et al., 1996).

There is review-level evidence to suggest that telephone counselling as a follow-up to face-to-face counselling may lead to a small increase in success rates compared to face-to-face interventions alone (Stead and Lancaster, 2001a).

There is review-level evidence that telephone cessation support is effective in increasing smoking cessation when implemented with other interventions (eg other educational approaches, clinical therapies, or a combination) in both clinical and community settings. The minimum intervention with evidence of effectiveness identified is proactive telephone support combined with patient cessation materials (Hopkins et al., 2001).

Exercise

A meta-analytic review of the effects of exercise on smoking cessation (Nishi et al., 1998)

This study reviewed intervention studies of the effectiveness of exercise on smoking cessation by means of a meta-analysis. The meta-analysis is based on five studies published between 1983 and 1995 that met the inclusion criteria; in three of these studies smoking cessation was the main aim. The exercise intervention employed in these studies differed in several characteristics including type, intensity, frequency and duration. For the studies included, follow-up was up to 24 months and two studies had biochemical verification of abstinence.

Overall, the results indicate that exercise might be more effective when combined with a smoking cessation programme. However, the authors concluded that the strong effect demonstrated by the evidence should be viewed as inconclusive due to the small number of studies and the small sample size of each study.

Exercise interventions for smoking cessation (Ussher et al., 2000, Ussher, 2001)

Both these papers relate to the same piece of work (one is a journal article, the other a Cochrane Review). While the background information that follows is primarily drawn from the Cochrane Review the evidence statements apply to both.

The aim of the review was to establish whether exercise-based interventions combined with a smoking cessation programme were more effective than a smoking cessation intervention (Ussher, 2001). The reviews identified eight studies that met the inclusion criteria (including a follow-up of at least six months), published between 1985 and 1999. All the studies were based in North America with predominately Caucasian samples.

None of the studies considered outcomes related to inequalities, such as occupation, socio-economic status or age, and details of any biochemical validation of smoking cessation were not given.

Only one of the eight trials demonstrated evidence for exercise aiding smoking cessation, although the authors commented that the other trials were too small to reliably exclude an effect of the intervention (six of the eight papers identified had fewer than 25 people in each treatment arm) and had numerous methodological limitations.

The authors also stated that comparison of the trials was complicated by differences in study design and intervention, with variations in the length, type (although most appeared to be fitness orientated programmes) and timing of interventions, the design of the controls and cessation programmes, as well as in the demographic characteristics recorded.

Evidence statement

Currently, there is a lack of review-level evidence to recommend exercise as an aid to smoking cessation (Nishi et al., 1998; Ussher et al., 2000; Ussher, 2001).

Review – Nishi et al., 1998 – Effects of exercise		
Comparison	Outcome	OR (95% CI)
Exercise versus control (studies primarily aimed at smoking cessation)	Smoking cessation	2.35 (0.75, 7.31)
Exercise versus control (studies where smoking cessation was not the main aim)	Smoking cessation	1.85 (0.65, 5.24)

Rapid aversive smoking

Aversive smoking for smoking cessation (Hajek and Stead, 2001)

This review aimed to determine the efficacy of rapid smoking and other aversive methods in helping smokers stop smoking and to determine whether there was a dose-response effect on smoking cessation at different levels of aversive smoking.

In general, aversion therapy pairs the stimulus provided by a cigarette with a negative/unpleasant stimulus. Rapid smoking is a form of aversion therapy whereby smokers generally puff a cigarette every six or 10 seconds smoking for three minutes, consuming three cigarettes, or until they feel unable to continue, which is then repeated three or four times. During this period, the smoker is asked to concentrate on the unpleasant sensations it causes.

This meta-analysis identified 25 studies that qualified for inclusion (including a follow-up of at least six months from the beginning of treatment), which were published between 1970 and 1993. Twelve studies were included in the efficacy of rapid smoking (a further 10 were included in the analysis of efficacy of other aversive methods and nine in the analysis of difference between the efficacy of less versus more aversive methods). All but one of the studies lacked biochemical validation of each self-report of abstinence.

The authors concluded that the efficacy of rapid smoking as an intervention for smoking cessation is unknown, but stressed the need for proper evaluation of the intervention using a more rigorous methodology. In addition, they also concluded that the dose-response (which may be defined as the relationship in which change in the amount, intensity, or duration of exposure is associated with a change in risk of a specified outcome) to aversive stimulation had not been adequately tested in terms of abstinence rates.

All but one of the studies had methodological problems, such as no or incomplete validation, lack of blinding, therapist biases, lack of information on continuous abstinence, and very small sample sizes. The authors commented that the poor methodological quality of the literature was explained by its age, with most aversive treatment studies being over 20 years old, and that the results of the meta-analysis should be interpreted in the light of these methodological considerations. Furthermore, the evaluation of psychological treatments is more difficult than evaluation of pharmacotherapies.

Overall the authors concluded that there was a clear need to revisit behaviour treatments that were never examined adequately, such as those in the review, and they needed to be evaluated using current methodology.

US public health service clinical practice guideline: treating tobacco use and dependence (Fiore, 2000)

For background information on Fiore (2000), refer to p24. As part of the meta-analysis, Fiore (2000) explored various types of counselling and behavioural therapies (62 studies) including aversive and rapid smoking. These were found to be effective for smoking cessation (aversive smoking – OR 1.7; 95% CI 1.04, 2.8 and rapid smoking – OR 2.0; 95% CI 1.1, 3.5).

Evidence statements

Currently, there is a lack of review-level evidence to determine the efficacy of rapid smoking, or whether there is a dose-response to aversive stimulation (Hajek and Stead, 2001; Fiore, 2000).

Currently, there is a lack of evidence on the specific efficacy for milder versions of aversive smoking (Hajek and Stead, 2001).

Review – Hajek and Stead, 2001 – Aversive smoking		
Comparison	Outcome	OR (95% CI)
Rapid smoking versus 'attention placebo' control	Abstinence at long-term follow-up	1.98 (1.36, 2.90)
Other aversion methods versus 'attention placebo' control	Abstinence at long-term follow-up	1.15 (0.73, 1.82)
More aversive versus less aversive methods (dose response)	Abstinence at long-term follow-up	1.66 (1.00, 2.78)

Individual behavioural counselling

Individual behavioural counselling for smoking cessation (Lancaster and Stead, 2001a)

The review assessed the effectiveness of more intensive counselling delivered by a smoking cessation counsellor (and excludes counselling delivered by doctors and nurses as part of clinical care) to a patient on a one-to-one basis. Counselling was broadly defined, based only on a minimum time spent in contact with the smoker, not according to the use of any specific behavioural approach.

Eleven studies were included in the review (with follow-up periods of at least six months), all of which were based in the US. The pooled results from 10 studies showed evidence that individual counselling (of more than 10 minutes) increased the likelihood of smoking cessation compared to less intensive support. This result was consistent when re-analysed excluding trials without randomisation and without biochemical validation of self-reported cessation (biochemical validation of self-reported non-smoking was carried out for all quitters in five studies). Although most trials recruited hospitalised smokers, counselling was also shown to be effective in a workplace setting and among community volunteers.

Two studies suggested that there was no benefit of intensive counselling compared to brief counselling, while another trial found no significant difference between individual counselling to group therapy as an adjunct to NRT.

US public health service clinical practice guideline: treating tobacco use and dependence (Fiore, 2000)

For background information on Fiore (2000), refer to p24. Fiore (2000) found that individual

counselling was more effective than no intervention (OR 1.7; 95% CI 1.4, 2.0) when analysing the efficacy of various types of intervention format (including self-help, proactive telephone counselling, and group counselling).

Evidence statement

There is review-level evidence that individual behavioural counselling interventions given outside routine clinical care by smoking cessation counsellors, including health educators and psychologists, assist smokers to quit (Lancaster and Stead, 2001a; Fiore, 2000).

Review – Lancaster and Stead, 2001a – Individual behavioural counselling		
Comparison	Outcome	OR (95% CI)
Counselling versus minimal contact control	Smoking cessation at longest follow-up	1.55 (1.27, 1.90)
Intensive counselling versus brief counselling	Smoking cessation at longest follow-up	1.17 (0.59, 2.34)
Individual versus group counselling	Smoking cessation at longest follow-up	1.33 (0.83, 2.13)

Group behaviour therapies

Group behaviour therapy programmes for smoking cessation (Stead and Lancaster, 2001b)

This review aimed to evaluate the use of group-delivered behavioural interventions to bring about smoking cessation.

The review identified 19 studies with follow-up periods of at least six months that compared a group programme (whereby smokers met and received some form of behavioural intervention, such as information, advice and encouragement or cognitive behavioural therapy delivered over at least two sessions) with another cessation treatment method (including self-help materials or individual counselling), or a control. The length, format and content of these programmes were found to be very variable and the authors took a broad approach to group programmes, making no distinction on the basis of

theoretical approach, therapists or intensity. The authors commented that most trials gave insufficient detail concerning randomisation and blinding. Seven studies reported no use of any validation of self-report of smoking cessation. A number of studies either used a mixture of biochemical measures and verification by family or colleagues, or only sought biochemical verification in a random sample of quitters.

The main finding was that group therapy programmes were more effective than provision of a self-help manual alone (with the same programme content) (OR 2.44; 95% CI 1.78, 3.36), although when different programmes were included the OR was reduced to 2.10 (95% CI 1.64, 2.70) (for different programmes only the OR was 1.64; 95% CI 1.09, 2.47), and this finding was found to be robust when trials using only randomised individuals were included in the analysis. In addition, five trials comparing group programmes to no intervention, or minimal contact, found evidence of higher quit rates.

Review – Stead and Lancaster, 2001b – Group behaviour therapies		
Comparison	Outcome	OR (95% CI)
Group format behavioural programmes versus other formats	Smoking cessation	2.10 (1.64, 2.70)
Group format behavioural programmes versus self-help (same programme content)	Smoking cessation	2.44 (1.78, 3.36)
Group format behavioural programmes versus self-help (different programmes)	Smoking cessation	1.64 (1.09, 2.47)
Group format behavioural programmes versus individual therapy	Smoking cessation	0.83 (0.54, 1.26)
Group format behavioural programmes versus individual (same programme content)	Smoking cessation	1.16 (0.47, 2.85)
Group format behavioural programmes versus individual (different programme content)	Smoking cessation	0.75 (0.47, 1.21)
Group format behavioural programmes versus physician or nurse advice	Smoking cessation	0.96 (0.69, 1.35)
Group format behavioural programmes versus health education	Smoking cessation	0.75 (0.26, 2.16)
Group format behavioural programmes versus physician or nurse advice or health education	Smoking cessation	0.94 (0.68, 1.30)
Group format behavioural programmes plus NRT versus NRT	Smoking cessation	0.89 (0.58, 1.36)

Additionally, two studies comparing group with individual treatment found no significant difference (OR 0.83; 95% CI 0.54, 1.26).

There was no evidence, based on five trials, of the superior effect of the addition of a group programme compared to advice from a healthcare provider and a pamphlet (OR 0.96; 95% CI 0.54, 1.26).

One study comparing a full group programme to an intervention with a single session of health education and one individual counselling session found no difference in cessation rates. And two studies found no difference in quit rates between a group programme and the control group when both interventions included NRT.

The authors commented that systematic reviews of behavioural interventions are difficult to conduct due to the problems of predefining comparison groups when trials use many treatment arms, and the problems of evaluating efficacy due to the choice of appropriate control conditions.

They concluded that there was insufficient evidence to identify effective and ineffective components of group programmes and suggested that unpublished literature may contribute to the evidence.

US public health service clinical practice guideline: treating tobacco use and dependence (Fiore, 2000)

For background information on Fiore (2000), refer to p24. Fiore (2000) found that group counselling/behaviour therapy programmes were more effective than no intervention (OR 1.3; 95% CI 1.1, 1.6) when analysing the efficacy of various types of intervention format (including self-help, proactive telephone counselling, and individual counselling).

Evidence statements

There is review-level evidence that group behaviour therapy programmes are better than self-help and other less intensive interventions in assisting smokers to quit (Stead and Lancaster, 2001b; Fiore, 2000).

Currently, there is a lack of review-level evidence on the effectiveness of group behaviour therapy programmes compared to intensive individual counselling in assisting smokers to quit (Stead and Lancaster, 2001b).

Self-help

Self-help interventions for smoking cessation (Lancaster and Stead, 2001b)

The review aimed to determine the effectiveness of different forms of self-help materials and adjuncts to self-help (such as computer-generated feedback and telephone hotlines). The authors defined self-help interventions as 'any manual or programme to be used by individuals to assist a quit attempt not aided by health professionals, counsellors or group support'. The review identified 45 trials that met the inclusion criteria, published between 1983 and 1999. The majority of trials were US-based, although five UK trials were included in the analysis. The trials varied in terms of the amount of face-to-face advice or counselling given and whether or not any materials were given to smokers in the control groups. Follow-up was at least six months after the start of the programme. Biochemical validation of all self-reports of quitting, or sufficient data to adjust quit rates for the level of misreport in a sample, were available in 17 trials.

Overall, those receiving self-help versus all controls found no significant effect on aiding smoking cessation (OR 1.09; 95% CI 0.93, 1.27). Additionally, based on nine trials, there was little evidence that self-help material on its own was an effective means of aiding smoking cessation (OR 1.23; 95% CI 1.02, 1.49), while three trials in which the controls received some form of written materials did not show any trend towards benefiting from more structured material (OR 0.86; 95% CI 0.65, 1.12). Five trials demonstrated that there was no evidence of a significant effect of self-help materials given with face-to-face contact regardless of whether controls received some written materials. Eleven trials suggested that self-help materials in addition to advice from healthcare professionals did not improve smoking cessation outcomes. In addition, little evidence was demonstrated by two studies of an effect of self-help materials in addition to nicotine replacement therapy (OR 0.94; 95% CI 0.67, 1.31). Other self-help interventions did not appear to be effective (see Tables 4 to 6, Appendix D).

In terms of enhancing self-help programmes, tailoring material for individuals appeared to have more of a benefit than standard materials (OR 1.41 95% CI 1.14, 1.75), while targeting materials to the perceived needs of a broadly defined group was not shown to be more

effective (OR 1.13; 95% CI 0.85, 1.50). However, there was insufficient evidence to identify which elements of personalisation may be important, or which theories should inform the tailoring of materials.

Although not strictly classed as a self-help intervention, six trials providing telephone counselling as a means of increasing the intensity of the intervention appeared to increase quit rates (OR 1.62; 95% CI 1.33, 1.97), as did one trial providing a smokers' helpline in addition to written materials (OR 1.67; 95% CI 1.11, 2.52).

Overall, the authors concluded that at best the effects of providing standardised self-help materials were modest.

Evidence statements

There is review-level evidence that self-help material on its own may provide a small increase in quitting compared to no intervention.

Currently, there is no review-level evidence that self-help materials produce incremental benefits over other minimal interventions such as advice from a healthcare professional or nicotine replacement therapy.

There is review-level evidence that self-help materials tailored for individual smokers are more effective in assisting smokers to quit than those that are not tailored.

Currently, there is a lack of review-level evidence to demonstrate that targeting self-help materials to the perceived needs of a broadly defined group is more effective.

There is review-level evidence to suggest that providing telephone counselling as a means of increasing the intensity of the intervention and providing a smokers' helpline, in addition to written materials, appear to increase quit rates.

(Lancaster and Stead, 2001b)

Acupuncture

US public health service clinical practice guideline: treating tobacco use and dependence (Fiore, 2000)

For background information on Fiore (2000), refer to p24. A separate meta-analysis on the use of acupuncture was conducted. The author found no evidence to support the efficacy of acupuncture as a smoking cessation treatment. The author also suggested that any effect of acupuncture may be produced by factors such as positive expectations about the procedure.

A meta-analysis of acupuncture techniques for smoking cessation (White et al., 1999); Acupuncture for smoking cessation (White et al., 2000)

Both papers relate to the same work (one is a journal article, the other a Cochrane Review). While the following information is primarily drawn from the Cochrane Review, the evidence statements apply to both papers.

White et al. (2000) found 18 studies that qualified for inclusion, carried out in the UK, France, Italy, Norway, Hong Kong, New Zealand, Canada and the US. These 18 studies identified a total of 20 randomised controlled trials for smoking cessation, which compared acupuncture with sham acupuncture (using needles at other places in the body not thought to be useful), another intervention or no treatment. Studies were also included that covered the application of electrical stimulation (known as electro-acupuncture), or the insertion of in-dwelling needles, small seeds, or a surgical suture which patients were instructed to press when they become aware of withdrawal symptoms. Study participants were tobacco smokers aged over 18 years who wished to stop smoking.

Smoking cessation was verified by biochemical testing in only four of the 20 trials. Cessation was measured at three time points – first at less than six weeks after the intervention, then at six and 12 months, with the 12

month point considered to be the most important outcome. However, only five of the studies measured cessation outcome at 12 months.

The authors found that acupuncture was not superior to sham acupuncture in smoking cessation at any time point (see Table 7, Appendix D). Similarly, there were no differences in outcome at any time point between acupuncture and other anti-smoking interventions (see Table 7, Appendix D). Acupuncture was only compared with no interventions in three studies. The results of these three studies demonstrated that acupuncture appeared to be superior to no intervention in early results (OR 5.88; 95% CI 2.66, 13.01), showed no difference at six months (OR 0.99; 95% CI 0.30, 3.24), and only one study gave results at 12 months (OR 2.44; 95% CI 1.15, 5.20).

The results from studies with different techniques did not show any one particular method to be superior to control interventions at any time point (see Table 8, Appendix D).

The authors noted that the studies included were subject to a number of biases, namely not reporting on randomisation, not verifying smoking cessation biochemically and failure to minimise the influence of the practitioner on the subjects. In addition, they pointed out that acupuncture stimulation which was intensive and continuous may have had an effect, but could not be deduced due to the limits of the included studies.

The earlier review (White et al., 1999) included 10 reports of 12 studies, and came to similar conclusions on the effectiveness of acupuncture for smoking cessation.

Evidence statement

Currently, there is a lack of review-level evidence to demonstrate that acupuncture is effective for smoking cessation (White et al., 1999, 2000; Fiore, 2000).

Review – White et al., 1999 – Acupuncture techniques		
Comparison	Outcome	OR (95% CI)
Acupuncture versus sham acupuncture	Early smoking cessation	1.20 (0.98, 1.48)
Acupuncture versus sham acupuncture	6 month smoking cessation	1.29 (0.82, 2.01)
Acupuncture versus sham acupuncture	12 month smoking cessation	1.03 (0.73, 1.46)

Hypnotherapy

Hypnotherapy for smoking cessation (Abbot et al., 2000)

Nine reports of trials qualified for inclusion in the review. The majority of the studies were North American, but one UK study was included. This review analysed five comparisons:

- 1 Hypnosis versus a waiting list/no treatment control
- 2 Hypnosis versus attention placebo/advice
- 3 Hypnosis versus psychological treatments
- 4 Hypnosis versus rapid/focused smoking
- 5 Hypnosis plus group therapy versus group therapy alone.

The studies varied greatly in the type of hypnotic induction used and its duration. Three studies mentioned the type of induction used; six did not describe the technique used. The length of the programme was described as varying from a single session, two sessions, or up to a nine-week period. The total duration of hypnosis administered during the study varied from 30 minutes to seven hours.

Study participants were smokers who wished to stop smoking, irrespective of gender, number of years smoking or level of nicotine dependency.

Abstinence from smoking was assessed at follow-up at least six months from the start of treatment. Both validated abstinence based on biochemical markers and abstinence based on self-report via telephone and postal questionnaires was accepted.

Due to significant statistical heterogeneity between the results of the contributing trials, pooled odds ratios could not be calculated for comparisons 1, 2 and 5.

For comparison 1, two small trials reported significantly greater odds of quitting following hypnosis, while one large trial showed no increased odds of quitting.

Comparison 2 was based on four trials: two trials showed no improved quitting, while the other two showed increased odds of quitting, although these were small and had zero control group quit rates.

Two trials each were included in the analyses of comparisons 3 and 4, the results of which did not provide evidence as to whether or not hypnotherapy was more or less effective than the alternative interventions.

Of the three trials included in comparison 5, two found a trend towards increased cessation, while one found the reverse trend.

The authors concluded that hypnotherapy had not been proven to be more effective on six month quit rates than other interventions, or than no intervention.

Evidence statement

Currently, there is a lack of review-level evidence to demonstrate that hypnotherapy is effective for smoking cessation (Abbot et al., 2000).

Review – Abbot et al., 2000 – Hypnotherapy		
Comparison	Outcome	OR (95% CI)
Hypnotherapy versus psychological treatments	Smoking cessation at 6 months plus follow-up	0.92 (0.42, 2.01)
Hypnotherapy versus rapid/focused smoking	Smoking cessation at 6 months plus follow-up	1.00 (0.32, 3.15)

Incentives

Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke (Hopkins et al., 2001)

For background information on Hopkins et al, (2001) refer to p20. The findings for the use of incentives, namely interventions to reduce patient out-of-pocket costs, were based on five studies judged to be of sufficient design quality and execution, all of which were conducted in the US.

These five studies included evaluated interventions that reduced or eliminated patient costs for nicotine gum or nicotine replacement. The follow-up periods for these studies ranged from six to 12 months, with a median of nine months.

One study reported significant differences in the use of nicotine gum by level of drug co-payment. The remaining four studies observed small but significant increases in the use of cessation therapies (with a median increase of 7%). All four studies also observed increases in tobacco use cessation. The studies with follow-up periods averaging nine months showed a small but significant increase in the cessation of cigarette smoking, with a median absolute increase of 7.8%.

Evidence statement

There is review-level evidence to demonstrate that reducing out-of-pocket costs for effective cessation therapies increases both use of the effective therapy and patient cigarette use cessation (Hopkins et al., 2001).

Section C: Interventions targeted at pregnant women

Interventions for promoting smoking cessation during pregnancy (Lumley et al., 2000)

The review was based on 44 trials that were conducted between 1975 and 1998. The majority were US-based, but UK trials were included.

Although there was significant heterogeneity among the 34 trials used in the pooled analysis, similar reduction in the odds of continued smoking in late pregnancy were calculated when limiting the analysis to trials with biochemically validated smoking cessation and with high quality scores for the intervention.

The studies reviewed found no effect of interventions on very low birth weight, neonatal death or perinatal mortality, although the authors commented that those trials that assessed these outcomes had a very low power to detect clinically worthwhile differences.

The authors noted that interventions involving additional group sessions during pregnancy were poorly attended in nearly all trials that planned them, and recommended that they should be abandoned.

The authors concluded that smoking cessation programmes in pregnancy appear to reduce smoking, low birth weight and pre-term birth, but no effect was detected for very low birth weight or perinatal mortality.

Review – Lumley et al., 2000 – Promoting smoking cessation during pregnancy		
Comparison	Outcome	OR (95% CI)
Treatment versus control	Continued smoking in late pregnancy	0.53 (0.47, 0.60)
Treatment versus control	Mean birth weight	28.84 (9.07, 48.61)
Treatment versus control	Low birth weight (<2,500g)	0.80 (0.67, 0.95)
Treatment versus control	Very low birth weight (<1,500g)	1.27 (0.70, 2.32)
Treatment versus control	Preterm birth (<37 or <36 weeks)	0.83 (0.69, 0.99)
Treatment versus control	Stillbirths	1.11 (0.67, 1.84)
Treatment versus control	Neonatal deaths	1.01 (0.35, 2.89)
Treatment versus control	Perinatal deaths	1.16 (0.74, 1.82)
Treatment versus control (trials with biochemically validated smoking cessation)	Continued smoking in late pregnancy	0.53 (0.45, 0.62)
Treatment versus control (interventions of high intensity)	Continued smoking in late pregnancy	0.54 (0.46, 0.63)
Treatment versus control (interventions with high quality scores)	Continued smoking in late pregnancy	0.52 (0.44, 0.60)
Treatment versus control (interventions of high intensity with high quality scores and biochemically validated smoking cessation)	Continued smoking in late pregnancy	0.53 (0.44, 0.63)
Treatment versus control (trials to prevent smoking relapse in women who stopped smoking early in pregnancy)	Continued smoking in late pregnancy	0.74 (0.53, 1.04)

Effective approaches to persuading pregnant women to quit smoking: a meta-analysis of intervention evaluation studies (Kelley et al., 2001)

The review identified 36 intervention evaluations reported in 28 studies, published between 1976 and 1998, including one unpublished study. These studies were conducted in the US, Canada, Australia, New Zealand and Europe. Of the 36 interventions, 31 provided pregnant women with leaflets or manuals, while all the studies also used additional components such as counselling, doctor’s advice or follow-up contacts. The 31 studies were classified and analysed into two groups in terms of the psychological change they sought to engender (threat perception or cognitive preparation).

Overall the meta-analysis demonstrated a positive effect for prenatal smoking cessation interventions and suggested that leaflet-based interventions are likely to be cost effective if incorporated into routine service delivery. In addition, the analysis indicated that interventions that used follow-up contact were likely to be more effective.

In terms of the psychological change the interventions sought to engender, interventions using leaflets promoting cognitive preparation for quitting were found to be more effective than those based on leaflets focusing on increasing the perceived threat of smoking during pregnancy (6.5% compared to 2.3%). However, this did not emerge as an independent effect in the multivariate analysis, indicating this result was confounded by the effect of the other intervention components.

The authors highlighted that current evaluations do not clarify how interventions have an effect, and that evaluations should compare the effectiveness of the various separate components of interventions to identify the critical elements.

The main concern with this meta-analysis was that the authors found there to be significant heterogeneity between effect sizes across studies, and no attempt was made to exclude studies to make the sample more homogeneous. Therefore, one should regard these results with caution.

A meta-evaluation of smoking cessation intervention research among pregnant women: improving the science and art (Windsor et al., 1998)

This systematic review identified 23 studies from 1986 to 1998 that met the authors’ inclusion criteria, of which 11 were judged to have had sufficient methodological quality. The main aim of the review was to identify salient points of interest for research on smoking cessation interventions with pregnant women, and to identify implications for further research.

A number of methodological problems with the trials were their limited descriptions of the populations, no reporting of drop-outs and refusals, a lack of documentation of the degree of patient exposure to the intervention, poor measurement of outcomes, and inaccurate calculation of quit rates – all of these issues affecting the interpretation of the trial results. Most of the studies did not have biochemical validation and relied on self-reported smoking status.

Review – Kelley et al., 2001 – Persuading pregnant women to quit smoking		
Comparison	Outcome	OR (95% CI)
Effect size of intervention	Smoking cessation	1.93 (1.69, 2.21)
Effect size with follow-up	Smoking cessation	Mean odds 2.24
Effect size with no follow-up	Smoking cessation	1.61
Effect size with individual counselling	Smoking cessation	1.91
Effect size with no individual counselling	Smoking cessation	2.05
Effect size with individual randomisation	Smoking cessation	1.65
Effect size with no individual randomisation	Smoking cessation	2.15

Findings from six trials demonstrated that tailoring intervention methods was important to achieve a behavioural impact, with process evaluation indicating that addressing barriers to behavioural change and the concerns of pregnant women led to a greater acceptance of interventions.

The demographic predictors of quitting among pregnant smokers who quit on their own were documented. These findings indicated that white, married, young and educated smokers were more likely to quit without the aid of an intervention.

Evidence statements

There is review-level evidence that smoking cessation programmes in pregnancy appear to reduce smoking, low birth weight and pre-term birth (Lumley et al., 2000; Kelley et al., 2001)

There is review-level evidence to demonstrate a positive effect for leaflet-based prenatal smoking cessation interventions, and these are likely to be cost effective if incorporated into routine service delivery (Kelley et al., 2001).

There is review-level evidence that tailoring intervention methods and addressing barriers to behavioural change and the concerns of pregnant women lead to a greater acceptance of interventions (Windsor et al., 1998).

There is review-level evidence that some population groups of pregnant women (namely white, married, young and educated pregnant smokers) are more likely to quit smoking without the aid of further interventions (Windsor et al., 1998).

Section D: Inequalities

Many of the review-level papers described in the previous sections included studies targeting low socio-economic, low education, high risk, vulnerable and ethnic minority groups. However, they did not address the differential effectiveness of interventions among these groups, or how much the different components of interventions affected them.

Hopkins et al. (2001) identified the following areas where interventions have been shown to be effective with disadvantaged populations, although this was specific to US populations:

- Increasing the unit price of cigarettes was demonstrated to be effective among white, black and Hispanic people, with two studies showing black adolescents and young adults to be more responsive to differences in product price than white adolescents and young adults
- Unit price increases were also demonstrated to be effective in increasing the cessation of cigarette smoking among black and Hispanic people, people with income below median and less than high school education; and also across most social classes
- Evaluation of a state-wide campaign in Florida to reduce the initiation of cigarette smoking provided evidence of the effectiveness of mass media campaigns among black and Hispanic people
- Mass media campaigns to increase the cessation of cigarette smoking were effective with Hispanic people and Vietnamese men
- Reducing out-of-pocket costs for effective therapies was shown to be effective in one study conducted among a low-income population
- Multi-component interventions that included patient telephone support were shown to be effective among pregnant women, African-Americans and older (60+ years) smokers.

Sowden and Arblaster (2000) highlighted that most mass media campaigns to date have not specifically targeted high-risk groups, although the review included two studies targeting girls and one study targeting high risk populations defined by parental education and income. Stead and Lancaster (2001a) reviewed one study comparing the benefits of either counselling or material tailored for African-Americans who called a helpline, which found some evidence that quit rates were higher after 12 months in the tailored material group.

Lumley et al. (2000) commented that given the strong association between social inequalities and continued smoking during pregnancy, health professionals need to support strategies in the wider community to reduce social inequalities.

Only one review (Fiore, 2000) stated explicitly that there was strong evidence that smoking cessation treatments were effective across different racial and ethnic minorities. However, this was from US-based populations, such as African-Americans, native Americans, Alaskan natives, Asian and Pacific islanders, and Hispanic people, and so it would be questionable whether this would be true for ethnic minority populations in the UK.

Conclusions

This evidence briefing has identified a number of public health interventions that are effective in reducing smoking initiation and/or further uptake of smoking, and increasing smoking cessation in the general population, based on evidence from systematic reviews and meta-analyses.

It should be noted that these interventions should be viewed in the context of current NHS smoking cessation services, which include the prescription of nicotine replacement therapy and bupropion, and which may increase their effectiveness.

However, none of the reviews explicitly addressed the issue of inequalities in their analyses, particularly with respect to smoking interventions that have a greater impact on lower rather than higher socio-economic groups. Consequently, there is a need to re-analyse the studies included in present systematic reviews and meta-analyses with the aim of including disadvantaged groups and assessing the differential impacts. If insufficient data exist to allow such analysis, then primary research will need to be undertaken to assess the differential effectiveness of smoking interventions among disadvantaged groups.

However, while there is little information about reducing inequalities in health, there are a number of recommendations that could be made at a population level. These include increasing the unit price for cigarettes, mass media campaigns combined with other interventions, health promotion and behavioural support, behavioural counselling and self-help strategies, and reducing out-of-pocket costs of effective cessation therapies.

Minimal cost-effectiveness data was found. Consequently, there is a need to re-analyse the primary studies in relation

to cost effectiveness. If insufficient data exist to allow such analysis, then primary research will need to be undertaken to assess the cost effectiveness of smoking interventions in general and among disadvantaged groups.

Gaps in the evidence base and recommendations for research

Based on the findings reported there are significant gaps in the review-level evidence for preventing and stopping smoking. The most pressing gaps and recommendations for research are set out as follows.

Inequalities

There is little review-level evidence on interventions to reduce smoking initiation and/or further uptake of smoking, and to increase smoking cessation in relation to reducing health inequalities. What little data there is on interventions targeting specific socio-economic, ethnic or vulnerable groups is typically from the US.

It has been noted (Graham, 1999) that past and current health promotion approaches to tobacco control may have contributed to the widening socio-economic gradient in tobacco use, with higher rates of uptake and effectiveness in higher socio-economic groups, particularly when interventions are targeted at the individual level. It has been suggested there is a need for a broader policy framework for health promotion and tobacco control that targets both social disadvantage and individual behaviour (Graham, 1999).

It has also been suggested (Graham, 1999) that interventions should be audited to assess their impact on the socio-economic gradient in tobacco use, so allowing the identification of interventions that have a greater impact on lower rather than higher socio-economic groups.

Further, single studies included in the identified reviews of each type of smoking intervention need to be reassessed in terms of whether they can provide sufficient data by high risk, vulnerable, low socio-economic, low education, or minority ethnic groups to contribute to new systematic reviews, if necessary contacting the authors for the data.

If such data do exist then new systematic reviews could be commissioned. This approach may be problematic since the studies would probably not have been designed to include representative samples of the groups in question, or the numbers in each group sampled may be very small. Also, such an approach may be considered scientifically questionable since the original studies were not designed to answer the question now being asked of the data.

If sufficient data do not exist then primary research on the effectiveness of smoking interventions among the appropriate groups needs to be commissioned, particularly in a UK setting.

Cost effectiveness

Although a number of effective interventions have been identified in the systematic review and meta-analysis literature, in terms of the general population there has been little reported evidence on the cost effectiveness of these interventions. What little data there is on cost effectiveness come from interventions targeting specific socio-economic, ethnic or vulnerable groups and is typically from the US. Again, this cost effectiveness analysis needs to be assessed in the context of the effect on high risk, vulnerable, low socio-economic and minority ethnic groups.

Intervention design

Researchers must endeavour to use rigorous methods to ensure that outcomes reported are robust. To do this, they should only measure sustained rates of cessation, rather than point prevalence; follow-up should occur for at least six months and preferably for one year or more; and biochemical markers must be used to confirm smoking outcome.

Other research recommendations

This briefing does not set a research agenda – other documents such as the report of the Scientific Committee on Tobacco and Health (Department of Health, 1998a), the white paper on tobacco (Department of Health, 1998b) and the NICE Technology Appraisal Guidance (NICE, 2002) have identified research topics. However, a number of research recommendations are discussed in the included reviews, as follows:

Strategies to reduce initiation and/or further uptake of smoking among children and adolescents

- Evaluate mass media prevention campaigns and their components (eg required intensity) to demonstrate their effectiveness on children's and adolescents' initiation.
- Investigate what interventions are most effective in combination with mass media campaigns and the most effective ways to maintain reductions in tobacco use into young adulthood.
- Assess the effectiveness of interventions to prevent cigarette sales to minors that includes linking changes in retailer behaviour to changes in young people's perceptions of cigarette availability and their smoking behaviour.
- Demonstrate the effectiveness of community and school-based prevention campaigns and their components, particularly in terms of being analysed at the correct level and with the measurement of appropriate outcomes.

Strategies to increase cessation of smoking among all smokers

- Identify which components of multi-component interventions that include mass media campaigns are most effective in increasing smoking cessation.
- Develop effective strategies to increase the frequency of identifying smokers and offering them advice and support by clinicians.
- Further investigate the effectiveness of advice to quit smoking given by non-physician clinicians, such as nurses, psychologists, pharmacists, dentists and dental hygienists.
- Further investigate the effectiveness of different peer and social support interventions in different contexts of smoking cessations, such as community interventions,

smokers' clinics and primary care/healthcare settings, and the differential impacts across population groups.

- Further develop effective methods of combining face-to-face counselling or other interventions with telephone follow-up to support quit attempts and reduce relapse.
- Further investigate the effectiveness of helpline telephone services (both proactive and reactive) that use different counselling protocols and call-back schedules, and what combination with other counselling formats is effective.
- Further evaluate the effectiveness of exercise interventions for smoking cessation by using large sample sizes in the trials.
- Further describe the relationship between different levels and timing of exercise interventions, and the effect on smoking abstinence, craving and mood.
- Further develop more effective individualised self-help materials for smoking cessation.
- Further investigate the effectiveness of acupuncture for smoking cessation that concentrates on intensity and length of exposure of the stimulation.
- Further investigate the effectiveness of hypnotherapy for smoking cessation, with the type of hypnotherapy being clearly defined and using larger trials.
- Further assess the efficacy of targeted versus generic interventions for different population groups.

Interventions targeted at pregnant women

- Further investigate effective interventions to prevent smoking relapse among pregnant women and women who have just given birth.
- Further develop effective intervention strategies among pregnant women who smoke in terms of contact time, number of sessions and duration of the smoking intervention.

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- Note that several Evidence Base papers are Cochrane Reviews – the references here are for the versions current at the time of the literature searches for this briefing. Some of the reviews have since been updated. The Cochrane Reviews database is now published by John Wiley & Sons, Chichester, and a full list of review titles is at: www.cochrane.org/cochrane/revabstr/mainindex.htm*

Other resources

The following websites were identified during this project and offer further information on smoking cessation resources:

- www.nice.org.uk – the NICE homepage for guidance on nicotine replacement therapy (NRT) and bupropion
- www.ash.org.uk – the Action on Smoking and Health (ASH) homepage with information on smoking with links to scientific and training resources and policy documents
- www.treatobacco.net – a database of treatments, policy initiatives, etc. sponsored by the World Health Organization and the Society for Research in Nicotine and Tobacco
- www.dh.gov.uk – the Department of Health’s tobacco policy team has a page with links to key policy and guidance documents
- www.quit.org.uk – the QUIT organisation homepage with practical guidance and materials relating to cessation
- www.hda.nhs.uk – the Health Development Agency home page with links to educational materials on smoking cessation topics.

APPENDIX A

Search strategy

1 MEDLINE smoking final search strategies (Duke University filter)

Ovid, 1996 to October week 5 2001

Total number of records = 355

Smoking cessation search strategy:

- 1 meta-analysis/ (1314)
- 2 exp review literature/ (548)
- 3 (meta-analy\$ or meta analy\$ or metaanaly\$).tw. (3094)
- 4 meta analysis.pt. (2492)
- 5 review academic.pt. (14335)
- 6 review literature.pt. (8600)
- 7 letter.pt. (76595)
- 8 review of reported cases.pt. (8807)
- 9 historical article.pt. (18937)
- 10 review multicase.pt. (791)
- 11 1 or 2 or 3 or 4 or 5 or 6 (27880)
- 12 7 or 8 or 9 or 10 (103911)
- 13 11 not 12 (27328)
- 14 animal/ (389630)
- 15 human/ (1056843)
- 16 14 and 15 (126074)
- 17 14 not 16 (263556)
- 18 13 not 17 (25584)
- 19 limit 18 to (english and yr=1996-2001) (22001)
- 20 exp Smoking Cessation/mt, px [Methods, Psychology] (736)
- 21 exp "Tobacco Use Cessation"/px, mt [Psychology, Methods] (778)
- 22 exp Bupropion/ct, pd, tu, ad [Contraindications, Pharmacology, Therapeutic Use, Administration & Dosage] (201)
- 23 ziban.mp. [mp=title, abstract, registry number word, mesh subject heading] (22)
- 24 exp Nicotinic Agonists/tu [Therapeutic Use] (177)
- 25 exp Substance Withdrawal Syndrome/th [Therapy] (60)
- 26 exp SMOKING/pc [Prevention & Control] (1456)
- 27 exp Behavior Therapy/mt [Methods] (922)
- 28 exp Health Promotion/og, mt [Organization & Administration, Methods] (2123)
- 29 exp NICOTINE/ad, ae, tu [Administration & Dosage, Adverse Effects, Therapeutic Use] (628)
- 30 exp "Tobacco Use Disorder"/th, pc, et [Therapy, Prevention & Control, Etiology] (261)
- 31 "nicotine replacement therapy".ti. (24)
- 32 nicotine patch\$.ti. (50)
- 33 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 29 or 30 or 31 or 32 (3707)

- 34 19 and 33 (138)
- 35 limit 34 to (english and yr=1996-2001) (138)
- 36 from 35 keep 1-138 (138)

Smoking prevention search strategy:

- 1 meta-analysis/ (1314)
- 2 exp review literature/ (548)
- 3 (meta-analy\$ or meta analy\$ or metaanaly\$).tw. (3094)
- 4 meta analysis.pt. (2492)
- 5 review academic.pt. (14335)
- 6 review literature.pt. (8600)
- 7 letter.pt. (76595)
- 8 review of reported cases.pt. (8807)
- 9 historical article.pt. (18937)
- 10 review multicase.pt. (791)
- 11 1 or 2 or 3 or 4 or 5 or 6 (27880)
- 12 7 or 8 or 9 or 10 (103911)
- 13 11 not 12 (27328)
- 14 animal/ (389630)
- 15 human/ (1056843)
- 16 14 and 15 (126074)
- 17 14 not 16 (263556)
- 18 13 not 17 (25584)
- 19 exp SMOKING/ (9581)
- 20 smok\$.ab,ti. (15566)
- 21 exp NICOTINE/ad, ae, sd [Administration & Dosage, Adverse Effects, Supply & Distribution] (525)
- 22 nicotine.ti,ab. (2346)
- 23 exp TOBACCO/ae [Adverse Effects] (217)
- 24 exp "TOBACCO USE DISORDER"/pc, th, et [Prevention & Control, Therapy, Etiology] (261)
- 25 exp TOBACCO SMOKE POLLUTION/ae, pc [Adverse Effects, Prevention & Control] (673)
- 26 exp Tobacco, Smokeless/ae, sd [Adverse Effects, Supply & Distribution] (104)
- 27 tobacco.ti,ab. (5665)
- 28 cigar\$.ti,ab. (4138)
- 29 (nicotine adj1 dependence).ti,ab. (232)
- 30 (tobacco adj1 dependence).ti,ab. (90)
- 31 exp Health Education/mt [Methods] (2548)
- 32 Public Health/mt, ed [Methods, Education] (267)
- 33 exp Patient Education/mt [Methods] (1544)
- 34 exp Health Promotion/mt [Methods] (1013)
- 35 exp Preventive Medicine/mt [Methods] (1344)
- 36 Counseling/mt [Methods] (271)
- 37 exp Adolescent Health Services/ (713)

38 exp Preventive Health Services/mt [Methods] (5614)
 39 exp Attitude to Health/ (30677)
 40 (smoking adj1 prevention).ti,ab. (149)
 41 or/31-40 (38285)
 42 19 or 20 (18229)
 43 21 or 22 (2422)
 44 23 or 24 or 25 or 26 or 27 (6145)
 45 28 or 29 or 30 (4357)
 46 42 or 43 or 44 or 45 (22080)
 47 31 or 32 or 33 or 34 or 35 or 38 or 39 or 40 (37577)
 48 46 and 47 (1371)
 49 limit 48 to (english and yr=1996-2001) (1166)
 50 19 or 20 or 24 or 25 (18360)
 51 35 or 38 or 40 (6988)
 52 50 and 51 (388)
 53 18 and 52 (9)
 54 exp SMOKING/pc [Prevention & Control] (1456)
 55 54 and 18 (44)
 56 40 or 54 (1522)
 57 18 and 56 (45)
 58 limit 57 to (english and yr=1996-2001) (43)
 59 35 or 38 (6848)
 60 56 and 59 (87)
 61 60 and 18 (2)
 62 limit 60 to (english and yr=1996-2001) (76)
 63 from 62 keep 1-76 (76)
 64 from 62 keep 1-76 (76)

Smoking inequalities search strategy:

1 meta-analysis/ (1314)
 2 exp review literature/ (548)
 3 (meta-analy\$ or meta analy\$ or metaanaly\$).tw. (3094)
 4 meta analysis.pt. (2492)
 5 review academic.pt. (14335)
 6 review literature.pt. (8600)
 7 letter.pt. (76595)
 8 review of reported cases.pt. (8807)
 9 historical article.pt. (18937)
 10 review multicase.pt. (791)
 11 1 or 2 or 3 or 4 or 5 or 6 (27880)
 12 7 or 8 or 9 or 10 (103911)
 13 11 not 12 (27328)
 14 animal/ (389630)
 15 human/ (1056843)
 16 14 and 15 (126074)
 17 14 not 16 (263556)
 18 13 not 17 (25584)
 19 Socioeconomic Factors/ (7148)
 20 disadvantag\$.ti,ab. (3988)
 21 exp POVERTY/ (3115)
 22 exp Social Class/ (2019)

23 (health adj1 inequalities).ti,ab. (275)
 24 exp TOBACCO/ (2181)
 25 exp Minority Groups/ (1146)
 26 exp SMOKING/px [Psychology] (721)
 27 19 or 20 or 22 or 25 (13669)
 28 26 and 27 (74)
 29 limit 28 to (english and yr=1996-2001) (69)
 30 [from 29 keep 1, 8, 10, 24, 46, 60... (0)
 31 [from 29 keep 93-95] (0)
 32 23 or 24 (2456)
 33 26 and 32 (31)
 34 limit 33 to (english and yr=1996-2001) (30)
 35 22 and 26 (18)
 36 [from 35 keep 6, 18-19] (0)
 37 [from 35 keep 18-19] (0)
 38 limit 26 to (english and yr=1996-2001) (664)
 39 18 and 38 (12)
 40 from 39 keep 1-12 (12)

2 PsycINFO smoking final search strategy (York filter)

Ovid, 1996 to October week 5, 2001

Total number of records retrieved = 92

1 tobacco smoking/ or smokeless tobacco/
 2 nicotine/
 3 1 or 2
 4 (smok\$ or nicotin\$ or tobacco or cigar\$ or hand-roll\$ or "hand roll\$" or bidi or paan or gutkha or snuff or "beetle nut\$" or betel).tw.
 5 3 or 4
 6 behavior therapy/ or behavior modification/ or aversion therapy/ or exposure therapy/ or implosive therapy/ or reciprocal inhibition therapy/ or response cost/ or systematic desensitization therapy/
 7 health behavior/
 8 exp exercise/
 9 health promotion/ or client education/ or lifestyle changes/
 10 social support networks/ or self help techniques/ or support groups/
 11 counseling/ or educational counseling/ or group counseling/
 12 drug therapy/
 13 6 or 7 or 8 or 9 or 10 or 11 or 12
 14 (behavio\$ ther\$ or budd\$ or clinic\$ or counsel\$ or health behavi\$ or physical activit\$ or health promot\$ or exercis\$ or lifestyle\$ or therap\$ or social support\$).tw.
 15. 13 or 14
 16 5 and 15
 17 smoking cessation/ or nicotine withdrawal/

18 bupropion/
 19 nicotin\$.tw.
 20 ((replac\$ adj5 therap\$) or gum or patch\$ or nasal
 spray\$).tw.
 21 (2 or 19) and 20
 22 (cessation\$ or stop\$).tw.
 23 5 and 22
 24 (bupropion or Zyban).tw.
 25 18 or 24
 26 16 or 17 or 21 or 23 or 25
 27 meta analysis.sh.
 28 meta-anal:.tw.
 29 metaanal:.tw.
 30 meta analysis.id.
 31 (systematic: and (review: or overview)).tw.
 32 (critical: and apprais:).tw.
 33 (critical: and review:).tw.
 34 or/27-33
 35 literature review.sh.
 36 literature review.id.
 37 35 or 36
 38 34 or 37
 39 treatment guidelines/
 40 (expert\$ or guideline\$).tw.
 41 evidence-base\$.tw.
 42 (evidence adj6 base\$).tw.
 43 38 or 39 or 40 or 41 or 42
 44 case report.sh.
 45 43 not 44
 46 45 and 26
 47 limit 46 to (human and english language)
 48 limit 47 to yr=1996-2002
 49 from 48 keep 2,4-7
 50 from 48 keep 12,14,18-21,24-27,29,31-32,35,39-
 40,46,48-50
 51 49 or 50
 52 from 48 keep 51,54-55,57-59,62,64,71,78-81,83,85,92-
 93,96-97,99-100
 53 51 or 52
 54 from 48 keep 102-103,105,110,114-116,118,125-128
 55 53 or 54
 56 from 48 keep 133,137,140-141,144,146,149,152,154-
 155,159,162-164,166,168-169
 57 55 or 56
 58 from 48 keep 169-170,175,177,179-182
 59 57 or 58
 60 public health/
 61 prevention/
 62 government policy making/ or laws/ or legislative
 processes/
 63 health education/ or health knowledge/
 64 primary health care/
 65 health attitudes/
 66 student personnel services/
 67 adolescent attitudes/
 68 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67
 69 ("public adj5 health " or "health adj5 educat\$" or school\$
 or "health fair\$" or "patient\$ adj5 educat\$" or
 adolescen\$ or preventi\$ or "attitude\$ adj5 health").tw.
 70 68 or 69
 71 social control/
 72 taxation/
 73 exp advertising/ or exp mass media/
 74 product design/
 75 69 or 70 or 71 or 72 or 73 or 74
 76 (tax\$ or law\$ or legislat\$ or polic\$ or jurisprudence or
 "mass media" or adverti\$ or ban\$ or restricti\$ or
 "control\$ adj5 strateg\$" or sponsor\$).tw.
 77 75 or 76
 78 prenatal exposure/
 79 (follow-up and (progeny or offspring)).tw.
 80 (delayed effect\$ and (progeny or offspring)).tw.
 81 ((follow-up or "delay\$ effect\$") and child\$).tw.
 82 ((prenatal\$ adj5 exposur\$) or time course\$ or time-course\$
 or life course\$ or life-course).tw.
 83 78 or 79 or 81 or 82
 84 exp socioeconomic status/ or disadvantaged/ or poverty/ or
 socioeconomic class attitudes/
 85 homeless/ or poverty areas/
 86 exp "racial and ethnic groups"/
 87 minority groups/
 88 ghettos/
 89 (socioeconomic or disadvantag\$ or poverty or homeless\$
 or ethnic\$ or minorit\$ or "inner cit\$" or inequalit\$ or
 "health impact assessment\$" or "lower income").tw.
 90 lower income level/
 91 84 or 85 or 86 or 87 or 88 or 89 or 90
 92 70 or 77 or 83 or 91
 93 5 and 92
 94 45 and 93
 95 limit 94 to (human and english language and yr=1996-
 2002)
 96 48 and 95
 97 95 not 96
 98 from 97 keep 1,3-4,9-10,13,15-17,20
 99 98 or 59

3 Sociological Abstracts smoking final search strategy

Ovid, 1996 to October week 5, 2001

Total number of records retrieved = 23

This strategy will give several false drops but it should ensure all relevant articles are retrieved

- 1 smoking/
- 2 (smok\$ or nicotin\$ or tobacco or cigar\$ or hand-roll\$ or "hand roll\$" or bidi or paan or gutkha or snuff or "beetle nut\$" or betel).mp.[mp=title, abstract, heading word, key phrase identifiers]
- 3 1 or 2
- 4 (bupropion or zyban).mp.[mp=title, abstract, heading word, key phrase identifiers]
- 5 3 or 4
- 6 literature reviews/
- 7 overview/
- 8 experts/
- 9 (((((((((((guideline\$ or review\$ or overview\$ or literature) adj3 search\$) or synthes\$) adj3 (literature\$ or research\$ or studies or data)) or critical\$) adj3 apprais\$) or meta-analys\$ or meta) adj analys\$) or metaanalys\$ or evidence) adj3 base\$) or evidence-base\$ or pooled) adj3 analys\$) or ((data adj2 pool\$) and studies)).mp [mp=title, abstract, heading word, key phrase identifiers]
- 10 (guideline\$ or review\$ or overview\$ or (literature and search\$) or (critical and apprais\$) or meta-analy\$ or (meta and analys\$) or metaanalys\$ or evidence-base\$ or (evidence and base\$)).af.
- 11 6 or 7 or 8 or 9 or 10
- 12 5 and 11
- 13 limit 12 to (english language and yr=1996-2001)
- 14 [from 13 keep 3,15,22,29,32,36-37,39-40,42-43,49,51, 54-58,62,65-66,69-70]

4 CINAHL smoking final search strategy (York filter)

Ovid, 1996 to September 2001

Total number of records retrieved = 154

- 1 meta analysis/
- 2 meta-analysis research/
- 3 metaanaly\$.tw.
- 4 meta-analy\$.tw.
- 5 cochrane\$.tw.
- 6 nursing interventions.pt.
- 7 (review\$ or overview\$).ti.
- 8 Literature Review/
- 9 Literature Searching/

- 10 Computerized Literature Searching/
- 11 (synthes\$ adj3 (literature\$ or research\$ or studies or data)).tw.
- 12 (medline or medlars or embase or scisearch or psycinfo or psychinfo or psyclit or psychlit).tw,sh.
- 13 pooled analy\$.tw.
- 14 ((data adj2 pool\$) and studies).tw.
- 15 ((hand or manual\$ or database\$ or data base\$ or computer\$) adj2 search\$).tw.
- 16 Reference Databases/
- 17 ((electronic\$ or bibliographic\$) adj2 (database\$ or data base\$)).tw.
- 18 review.pt.
- 19 (review\$ or overview\$).ab.
- 20 (systematic\$ or methodologic\$ or quantitative\$ or research\$ or literature\$ or studies or trial\$ or effective\$).ab.
- 21 18 and 20
- 22 ((review\$ or overview\$) adj10 (systematic\$ or methodologic\$ or quantitative\$ or research\$ or literature\$ or studies or trial\$ or effective\$)).ab.
- 23 1 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 21 or 22
- 24 editorial.pt.
- 25 letter.pt.
- 26 case study.pt.
- 27 Record Review/
- 28 Peer Review/
- 29 (retrospective\$ adj2 review\$).tw.
- 30 (case\$ adj2 review\$).tw.
- 31 (record\$ adj2 review\$).tw.
- 32 (patient\$ adj2 review\$).tw.
- 33 (patient\$ adj2 chart\$).tw.
- 34 (peer adj2 review\$).tw.
- 35 (chart\$ adj2 review\$).tw.
- 36 (case\$ adj2 report\$).tw.
- 37 exp Case Control Studies/
- 38 exp Prospective Studies/
- 39 Case Studies/
- 40 Animal Studies/
- 41 (rat\$ or mouse or mice or hamster\$ or animal\$ or dog\$ or cat\$ or rabbit\$ or bovine or sheep).tw.
- 42 or/24-41
- 43 42 not (42 and 23)
- 44 23 not 43
- 45 Tobacco/
- 46 Tobacco, Smokeless/
- 47 Passive Smoking/
- 48 (smok\$ or nicotin\$ or tobacco or cigar\$ or hand-roll\$ or "hand roll\$" or bidi or paan or gutkha or snuff or "beetle nut\$" or betel).tw.

49 SMOKING/
 50 Nicotine/
 51 or/45-50
 52 Public Health/
 53 Health Education/
 54 exp School Health Services/
 55 health fairs/ or patient education/ or school health
 education/ or student health education/
 56 Health Promotion/
 57 counseling/ or anticipatory guidance/ or peer counseling/
 58 adolescent health services/ or community health services/
 or community health nursing/ or preventive health care/ or
 exp student health services/ or health services for the
 aged/ or health services for the indigent/ or health
 services, indigenous/ or women's health services/
 59 Attitude to Health/
 60 ("public health" or "health educat\$" or "health fair\$" or
 "patient adj2 educat\$" or "health adj4 promot\$" or
 counsel\$ or prevent\$ or "attitude\$ adj4 health" or
 school\$ or adolescen\$ or student\$ or elderly\$ or
 communit\$).tw.
 61 or/52-60
 62 61 and 51
 63 62 and 44
 64 limit 63 to (english and yr=1996-2001)
 65 SMOKING/nu, dt, ed, pf, rh, th [Nursing, Drug Therapy,
 Education, Psychosocial Factors, Rehabilitation, Therapy]
 66 Nicotine/ai, tu [Antagonists and Inhibitors, Therapeutic
 use]
 67 Smoking/lj, pc [Legislation and Jurisprudence, Prevention
 and Control]
 68 Passive Smoking/lj, ed, pc, pf [Legislation and
 Jurisprudence, Education, Prevention and Control,
 Psychosocial Factors]
 69 Smoking Cessation/
 70 "SMOKING CESSATION ASSISTANCE (IOWA NIC)"/ or
 SMOKING CESSATION PROGRAMS/
 71 "RISK CONTROL: TOBACCO USE (IOWA NOC)"/
 72 65 or 66 or 67 or 68 or 69 or 70 or 71
 73 meta analysis/
 74 meta-analysis research/
 75 metaanaly\$.tw.
 76 meta-analy\$.tw.
 77 cochrane\$.tw.
 78 nursing interventions.pt.
 79 (review\$ or overview\$).ti.
 80 Literature Review/
 81 Literature Searching/
 82 Computerized Literature Searching/
 83 (synthes\$ adj3 (literature\$ or research\$ or studies or
 data)).tw.
 84 (medline or medlars or embase or scisearch or psycinfo or
 psychinfo or psyclit or psychlit).tw,sh.
 85 pooled analy\$.tw.
 86 ((data adj2 pool\$) and studies).tw.
 87 ((hand or manual\$ or database\$ or data base\$ or
 computer\$) adj2 search\$).tw.
 88 Reference Databases/
 89 ((electronic\$ or bibliographic\$) adj2 (database\$ or data
 base\$)).tw.
 90 review.pt.
 91 (review\$ or overview\$).ab.
 92 (systematic\$ or methodologic\$ or quantitative\$ or
 research\$ or literature\$ or studies or trial\$ or
 effective\$).ab.
 93 90 and 92
 94 ((review\$ or overview\$) adj10 (systematic\$ or
 methodologic\$ or quantitative\$ or research\$ or literature\$
 or studies or trial\$ or effective\$)).ab.
 95 73 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83
 or 84 or 85 or 86 or 87 or 88 or 89 or 93 or 94
 96 editorial.pt.
 97 letter.pt.
 98 case study.pt.
 99 Record Review/
 100 Peer Review/
 101 (retrospective\$ adj2 review\$).tw.
 102 (case\$ adj2 review\$).tw.
 103 (record\$ adj2 review\$).tw.
 104 (patient\$ adj2 review\$).tw.
 105 (patient\$ adj2 chart\$).tw.
 106 (peer adj2 review\$).tw.
 107 (chart\$ adj2 review\$).tw.
 108 (case\$ adj2 report\$).tw.
 109 exp Case Control Studies/
 110 exp Prospective Studies/
 111 Case Studies/
 112 Animal Studies/
 113 (rat\$ or mouse or mice or hamster\$ or animal\$ or dog\$ or
 cat\$ or rabbit\$ or bovine or sheep).tw.
 114 or/96-113
 115 114 not (114 and 95)
 116 95 not 115
 117 116 and 72
 118 limit 117 to (english and yr=1996-2001 and english)
 119 Tobacco/
 120 Tobacco, Smokeless/
 121 Passive Smoking/
 122 (smok\$ or nicotin\$ or tobacco or cigar\$ or hand-roll\$ or
 "hand roll\$" or bidi or paan or gutkha or snuff or "beetle
 nut\$" or betel).tw.
 123 or/119-122

- 124 exp behavior therapy/ or cognitive therapy/
125 Health Behavior/
126 EXERCISE/
127 Support, Psychosocial/
128 Counseling/
129 Drug Therapy/
130 Health Promotion/
131 Health Education/
132 ("behav\$ adj therap\$" or exercis\$ or counsel\$ or "social support\$" or "buddy system\$" or "smok\$ adj clinic\$" or "physical adj activit\$").tw.
133 123 and 132
134 cessation\$.mp. or stop\$.tw. [mp=title, cinahl subject heading, abstract, instrumentation]
135 123 and 134
136 BUPROPION/
137 bupropion.tw.
138 Zyban.tw.
139 Nicotine Replacement Therapy/
140 "nicotine replacement therapy".tw.
141 Nicotinic Agonists/tu [Therapeutic use]
142 ("nicotine patch\$" or "nicotine gum" or "nicotine nasal spray").tw.
143 or/136-142
144 143 or 135 or 133
145 144 and 116
146 limit 145 to (english and yr=1996-2001 and english)
147 146 or 117
148 from 147 keep 4-5,7,9-17,19-24,26-39
149 from 147 keep 41-42,44,47-48,50,53-56,59-63
150 limit 149 to (english and yr=1996-2001)
151 limit 148 to (english and yr=1996-2001)
152 146 or 118
153 152 not (151 or 150)
154 from 153 keep 8,17,19-25,28-31,33,35-38,40-42,45-50
155 153 not 154
156 from 155 keep 22-26,28,30,32-33,36,39-41,43-45,48-51,53-54,57,60,62-65,68-69,72-74,76-78,80-85,87-89
157 153 not 156
158 from 157 keep 17
159 from 157 keep 19-25,28-31,33,35-49,52,73,75-78
160 148 or 149 or 154 or 156 or 158 or 159
161 from 160 keep 1-127
162 64 not 146
163 from 162 keep 1-2,6-9,11,14,21-23,29-30,32-33,37-39,43,47,52,57,60,64-65,67-68,71,73-74,76,78,84-85,87
164 163 or 161
165 164 not 161
166 from 165 keep 1-21
167 Legislation/
168 Health Promotion/lj [Legislation and Jurisprudence]
169 Health Policy/ei, lj [Ethical Issues, Legislation and Jurisprudence]
170 social control/ or "drug and narcotic control"/ or jurisprudence/ or "minors (legal)"/
171 exp Public Policy/
172 Taxes/
173 Licensure/
174 exp Communications Media/
175 marketing/ or advertising/
176 product packaging/ or product labeling/
177 (legisla\$ or polic\$ or "social adj5 control\$" or jurisprudence or tax\$ or licens\$ or media or advert\$ or pack\$ or label\$ or "sale\$ adj2 ban\$" or "smok\$ adj4 restric" or "smok\$ adj2 ban\$" or control\$ or crim\$ or illegal\$ or pric\$ or sponsor\$).tw.
178 or/167-177
179 178 and 51
180 179 and 44
181 limit 180 to (english and yr=1996-2001)
182 181 not 152
183 182 not 164
184 from 183 keep 51
185 from 183 keep 18,25,29,41,48,51,54,57
186 184 or 185
187 from 186 keep 1-8
188 or/124-131
189 188 and 123
190 189 and 116
191 limit 190 to (english and yr=1996-2001)
192 191 not (152 or 164 or 183)
193 limit 161 to yr=1996-2001
194 161 not 193
195 from 194 keep 1-3
196 exp Prospective Studies/
197 Maternal Behavior/
198 maternal exposure/ or paternal exposure/
199 Prenatal Exposure Delayed Effects/
200 (life-course or "life adj2 course" or time-course or "time adj2 course" or "maternal adj2 behavio\$" or "paternal adj2 behavio\$" or "delay\$ adj5 effect\$").tw.
201 (follow-up and (progeny or offspring)).tw.
202 ("long term outcome\$" or "long-term adj outcome\$").tw.
203 or/196-202
204 51 and 203
205 116 and 204
206 limit 205 to (english and yr=1996-2001)
207 from 206 keep 10
208 Health Services Accessibility/
209 exp "Health Services Needs and Demand"/
210 Social Class/ or Socioeconomic Factors/ or Poverty/
211 exp Ethnic Groups/

212 HOMELESS PERSONS/ or Homelessness/
 213 Minority Groups/
 214 (socioeconomic\$ or "social class\$" or ethnic\$ or
 homeless\$ or "minority group\$" or "inner cit\$" or
 "social\$ disadvantag\$" or traveller\$ or "health inequalit\$" or
 "health impact assessment\$" or poverty).tw.
 215 Community Assessment/
 216 or/208-215
 217 51 and 216
 218 116 and 217
 219 limit 218 to (english and yr=1996-2001)
 220 from 219 keep 3,6,11,15,18,22-23,27,30
 221 220 not (207 or 187 or 152 or 164 or 64)
 222 from 221 keep 1
 223 148 or 149 or 154 or 156 or 158 or 159 or 161 or 163 or
 166 or 184 or 185 or 187 or 195 or 207 or 220 or 222
 224 limit 223 to yr=1996-2001

5 LLIDU Smoking search terms

Smoking terms

MeSH (MEDLINE subject headings)

Smoking
 Nicotine
 Tobacco
 Tobacco, smokeless (NT of tobacco, used for snuff, paan,
 gutkha, betel nut)
 "tobacco-use-disorder"
 tobacco smoke pollution (used for passive smoking in MEDLINE)
 passive smoking CINAHL term

Textwords

Smok*
 Nicotin*
 tobacco
 (used for: smoke, smoker, smoking, pipe smoking, smokeless
 tobacco, passive smoking, environmental tobacco smoke,
 chewing tobacco, oral tobacco, tobacco dependence, tobacco
 use disorder, nicotine, nicotine dependence, nicotine use disorder)
 cigar*
 (used for: cigars, cigarettes)
 hand-roll*
 hand roll*
 (used for hand rolling, hand rolled)
 bidi
 paan
 gutkha
 snuff
 beetle nut*
 betel (for betel nut)

Smoking cessation terms

MeSH (MEDLINE subject headings)

Smoking cessation
 Tobacco use cessation (BT of smoking cessation)
 Bupropion
 Behavior therapy
 Cognitive therapy CINAHL term
 Health behavior
 Exercise
 Social support
 Counselling
 Drug therapy
 Nicotinic agonists/tu (tu = therapeutic use)
 Support, psychosocial CINAHL term
 Nicotine replacement therapy CINAHL term

Textwords

Cessation
 Behav* adj therap*
 Health adj behav*
 Exercis*
 Social support*
 Counsel*
 Bupropion
 Zyban
 Buddy system*
 Smok* adj clinic*
 Physical adj activit*
 Nicotine patch*
 Nicotine replacement therap*
 Nicotine gum
 Nicotine withdrawal
 Nicotine nasal spray*

Smoking prevention terms

MeSH (MEDLINE subject headings)

Schools-public-health
 Health education
 Public health (BT of health education)
 School health services
 Health fairs (NT of health education)
 Patient education
 Health promotion
 Adolescent health services
 Preventive health services
 Attitude to health
 Anticipatory guidance CINAHL term
 Peer counseling CINAHL term
 Community health nursing CINAHL term

Preventive health care CINAHL term
 Health services for the aged CINAHL term
 Health services for the indigent CINAHL term
 Health services, indigenous CINAHL term

Textwords

Public adj health
 Health adj educat*
 Health adj fair*
 Patient adj educat*
 Health adj promot*
 Prevent*
 Attitude* adj health

Smoking legislation/policy terms

MeSH (MEDLINE subject headings)

Legislation
 Tobacco industry/lj (lj = legislation & jurisprudence)
 Health policy/lj (NT of public policy)
 Public policy
 Social control policies/lj
 Jurisprudence
 Taxes
 Licensure
 "drug and narcotic control"
 mass media
 advertising
 communications media
 "minors (legal)" CINAHL term
 product packaging
 product labeling

Textwords

Legisla*
 Polic*
 Social adj control*
 Jurisprudence
 Tax*
 Licens*
 Media
 Advert*
 Pack*
 Label*
 Sale* adj ban*
 Smok* adj restrict*
 Smok* adj ban*
 Smok* adj control*
 Tobacco adj control*
 Illegal sale*
 Sponsor*

Time course/ life course terms

MeSH (MEDLINE subject headings)

Maternal behavior
 Maternal exposure
 Paternal exposure CINAHL term
 Prenatal exposure
 Life-style
 Prenatal exposure, delayed effects

Textwords

Life-course
 Life adj course
 Time-course
 Time adj course
 Maternal adj behavio*
 Paternal adj behavio*
 Delay* adj effect*
 Follow-up and (progeny or offspring)
 Long term outcome*
 Long-term outcome*

Health inequality terms

MeSH (MEDLINE subject headings)

Socioeconomic-factors
 Social class
 poverty
 Social-conditions (NT of socioeconomic-factors)
 Health-services-accessibility
 Health-services-needs-and-demands
 Ethnic groups
 Minority groups CINAHL term
 Health priorities
 Womens-health-services
 Aged
 Homeless persons
 Community assessment CINAHL term

Textwords

Socio-economic*
 Socioeconomic*
 Social adj class*
 Ethnic*
 Homeless*
 Minority adj group*
 Inner adj cit*
 Social adj disadvantag*
 Traveller*
 Health adj inequalit*
 "health impact assessment*"
 poverty
 elderly

APPENDIX B

HDA Evidence Base – critical appraisal tool

Authors: _____

Title: _____

Source: _____

Relevance to topic			
Does this paper address your topic area?	Yes	No	Unsure
Circle the type of paper:			
• Systematic review			
• Meta-analysis			
• Synthesis			
• Literature review			
• Other review (please specify)			
Does it address (circle as appropriate)?			
• Effectiveness (interventions and treatments)			
• Causation			
• Monitoring and surveillance trends			
• Cost			
• Other (please specify)			
Transparency			
Does the paper have a clearly focused aim or research question?	Yes	No	Unsure
Consider whether the following are discussed:			
• The population studied	Yes	No	Unsure
• The interventions given	Yes	No	Unsure
• The outcomes considered	Yes	No	Unsure
• Inequalities	Yes	No	Unsure
Systematicity			
Do the reviewers try to identify all relevant English language studies?	Yes	No	Unsure
Consider whether details are given for:			
• Databases searched	Yes	No	Unsure
• Years searched	Yes	No	Unsure
• References followed up	Yes	No	Unsure
• Experts consulted	Yes	No	Unsure
• Grey literature searched	Yes	No	Unsure
• Search terms specified	Yes	No	Unsure
• Inclusion criteria described	Yes	No	Unsure
Is it worth continuing?	Yes	No	
Why/why not?			

Quality			
Do the authors address the quality (rigour) of the included studies? Consider whether the following are used:	Yes	No	Unsure
• A rating system	Yes	No	Unsure
• More than one assessor	Yes	No	Unsure
If study results have been combined, was it reasonable to do so? Consider whether the following are true:	Yes	No	Unsure
• Are the results of included studies clearly displayed?	Yes	No	Unsure
• Are the studies addressing similar research questions?	Yes	No	Unsure
• Are the studies sufficiently similar in design?	Yes	No	Unsure
• Are the results similar from study to study (test of heterogeneity)?	Yes	No	Unsure
• Are the reasons for any variation in the results discussed?	Yes	No	Unsure
What is the overall finding of the review? Consider: • How the results are expressed (numeric – relative risks, etc) • Whether the results could be due to chance (p -values and confidence intervals)			
Are sufficient data from individual studies included to mediate between data and interpretation/conclusions?	Yes	No	Unsure
Does this paper cover all appropriate interventions and approaches for this field (within the aims of the study)? If no, what?	Yes	No	Unsure
Relevance to UK			
Can the results be applied/are generalisable to a UK population/population group?	Yes	No	Unsure
• Are there cultural differences from the UK?	Yes	No	Unsure
• Are there differences in healthcare provision with the UK?	Yes	No	Unsure
• Is the paper focused on a particular target group (age, sex, population sub-group etc)?	Yes	No	Unsure
Accept for inclusion onto HDA Evidence Base?	Yes	No	Refer to third party
Additional comments			

APPENDIX C

Included Evidence Base papers

Systematic reviews and meta-analyses of interventions to reduce smoking initiation and to increase smoking cessation described in the evidence briefing

Author(s)	Type of intervention	Number of studies	Inclusion of UK studies
Abbot et al., 2000	Increase cessation: Hypnotherapy	9	Yes
Ashenden et al., 1997	Increase cessation: Promoting lifestyle change in general practice	23	Yes
Bains et al., 1998	Increase cessation: Incentives	17	Yes
Fiore, 2000	Reduce initiation and increase cessation	Review of interventions	Not stated
Hajek and Stead, 2001	Increase cessation: Aversive smoking	25	Not stated
Hopkins et al., 2001	Reduce initiation and increase cessation	Review of interventions	Not stated
Kelley et al., 2001	Increase cessation: Interventions during pregnancy	36	Not stated
Lancaster and Stead, 2001a	Increase cessation: Individual behavioural counselling	11	No
Lancaster and Stead, 2001b	Increase cessation: Self-help interventions	45	Yes
Lichtenstein et al., 1996	Increase cessation: Telephone counselling	13	Not stated
Lumley et al., 2000	Increase cessation: Interventions during pregnancy	44	Yes
May et al., 2000	Increase cessation: Social support interventions	10	Not stated
Mullen et al., 1997	Increase cessation: Patient education and counselling	35	Not stated
Nishi et al., 1998	Increase cessation: Exercise interventions	5	Not stated
Rice, 1999	Increase cessation: Nurse interventions	19	Yes
Rice et al., 2000	Increase cessation: Nurse interventions	22	Yes
Rooney et al., 1996	Increase cessation: Peer or social-type programmes	90	Not stated
Silagy and Stead, 2000	Increase cessation: Physician advice	34	Yes
Sowden and Arblaster, 2000	Reduce initiation: Mass media interventions	6	Not stated
Sowden and Arblaster, 2001	Reduce initiation: Community interventions	13	Yes
Stead and Lancaster, 2000	Reduce initiation: Preventing cigarette sales to minors	27	Not stated
Stead and Lancaster, 2001a	Increase cessation: Telephone counselling	23	No
Stead and Lancaster, 2001b	Increase cessation: Group behaviour therapy	19	No
Stead and Lancaster, 2001c	Reduce initiation: Preventing cigarette sales to minors	30	Yes
Ussher et al., 2000	Increase cessation: Exercise interventions	8	No
Ussher, 2001	Increase cessation: Exercise interventions	8	No
White et al., 1999	Increase cessation: Acupuncture	12	Not stated
White et al., 2000	Increase cessation: Acupuncture	18	Yes
Windsor et al., 1998	Increase cessation: Interventions during pregnancy	8	Yes

APPENDIX D

Tables extracted from Evidence Base papers

Table 1: Review – Stead and Lancaster 2001a – Proactive telephone counselling		
Comparison	Outcome	OR (95% CI)
Telephone contact in addition to self-help versus minimal intervention control	Smoking cessation at longest follow-up	1.56 (1.10, 3.15)
Telephone contact with self-help versus none	Smoking cessation at longest follow-up	1.17 (0.56, 2.43)
Telephone contact and an offer of self-help material versus none	Smoking cessation at longest follow-up	1.88 (0.91, 3.88)
Telephone contact in addition to self-help material and hotline reminder versus none	Smoking cessation at longest follow-up	0.97 (0.47, 2.04)
All telephone contact as an adjunct to face-to-face interventions without pharmacotherapy versus control	Smoking cessation at longest follow-up	1.08 (0.87, 1.33)
Telephone contact as an adjunct to face-to-face interventions without pharmacotherapy versus physician prompt with tailored mailing	Smoking cessation at longest follow-up	0.50 (0.21, 1.18)
Telephone contact as an adjunct to face-to-face interventions without pharmacotherapy following physician intervention versus physician prompt alone	Smoking cessation at longest follow-up	1.09 (0.70, 1.70)
Telephone contact as an adjunct to face-to-face interventions without pharmacotherapy following intensive cessation clinic versus clinic alone	Smoking cessation at longest follow-up	1.10 (0.86, 1.43)
Telephone contact as an adjunct to face-to-face interventions without pharmacotherapy versus a single information session on self-help materials alone	Smoking cessation at longest follow-up	3.69 (0.87, 15.63)

Table 2: Review – Stead and Lancaster 2001a – Proactive telephone counselling		
Comparison	Outcome	OR (95% CI)
All telephone contact as an adjunct to pharmacotherapy versus control	Smoking cessation at longest follow-up	1.08 (0.82, 1.43)
All telephone contact as an adjunct to pharmacotherapy versus nicotine patch and physician advice alone	Smoking cessation at longest follow-up	0.96 (0.60, 1.52)
All telephone contact as an adjunct to pharmacotherapy versus nicotine patch, single group and hotline access alone	Smoking cessation at longest follow-up	0.97 (0.56, 1.69)
All telephone contact as an adjunct to pharmacotherapy versus nicotine patch alone	Smoking cessation at longest follow-up	1.42 (0.70, 2.87)
All telephone contact as an adjunct to pharmacotherapy versus nicotine gum and physician advice alone	Smoking cessation at longest follow-up	1.22 (0.69, 2.17)
Multiple sessions (up to six calls) versus single call and self-help materials	Smoking cessation at longest follow-up	1.36 (1.01, 1.83)

Table 3: Review – Stead and Lancaster 2001a – Reactive telephone counselling		
Comparison	Outcome	OR (95% CI)
Hotline and self-help materials versus self-help only	Smoking cessation at longest follow-up	1.74 (1.12, 2.690)
Hotline and self-help materials for cessation maintenance versus nothing	Smoking cessation at longest follow-up	0.82 (0.63, 1.08)
Hotline access for relapse prevention in quitters versus control	Smoking cessation at longest follow-up	1.08 (0.60, 1.93)
Stage-based counselling versus general information	Smoking cessation at longest follow-up	1.13 (0.68, 1.88)
Tailored counselling versus standard counselling	Smoking cessation at longest follow-up	1.12 (0.78, 1.59)
Stage-based or tailored counselling versus general information or standard counselling	Smoking cessation at longest follow-up	1.12 (0.84, 1.50)

Table 4: Review – Lancaster and Stead, 2001b – Self-help interventions for smoking cessation

Comparison	Outcome	OR (95% CI)
Self-help versus no self-help controls (no face-to-face contact in either group, and control group given no material)	Smoking cessation at longest follow-up	1.23 (1.02, 1.49)
Self-help versus no self-help controls (no face-to-face contact in either group, and control group given leaflet/pamphlet)	Smoking cessation at longest follow-up	0.86 (0.65, 1.12)
Self-help versus all no self-help controls (no face-to-face contact in either group)	Smoking cessation at longest follow-up	1.09 (0.93, 1.27)
Self-help versus no self-help controls (face-to-face contact in both groups, and control group given no material)	Smoking cessation at longest follow-up	1.09 (0.83, 1.42)
Self-help versus no self-help controls (face-to-face contact in both groups, and control group given leaflet/pamphlet)	Smoking cessation at longest follow-up	1.45 (0.98, 2.15)
Self-help versus all no self-help controls (face-to-face contact in both groups)	Smoking cessation at longest follow-up	1.19 (0.96, 1.49)
Self-help versus no self-help controls (face-to-face contact plus advice in both groups, and control group given no material)	Smoking cessation at longest follow-up	0.91 (0.71, 1.17)
Self-help versus no self-help controls (face-to-face contact plus advice in both groups, and control group given leaflet/pamphlet)	Smoking cessation at longest follow-up	1.15 (0.77, 1.72)
Self-help versus all no self-help controls (face-to-face contact plus advice in both groups)	Smoking cessation at longest follow-up	0.97 (0.78, 1.21)

Table 5: Review – Lancaster and Stead, 2001b – Self-help interventions for smoking cessation

Comparison	Outcome	OR (95% CI)
Self-help versus no self-help controls (no face-to-face contact in either group, and control group given no material)	Long-term abstinence	1.23 (1.02, 1.49)
Self-help versus no self-help controls (no face-to-face contact in either group, and control group given leaflet/pamphlet)	Long-term abstinence	0.86 (0.65, 1.12)
Self-help versus no self-help controls (face-to-face contact in both groups, and control group given no material)	Long-term abstinence	1.09 (0.83, 1.42)
Self-help versus no self-help controls (face-to-face contact in both groups, and control group given leaflet/pamphlet)	Long-term abstinence	1.45 (0.98, 2.15)
Self-help versus no self-help controls (face-to-face contact plus advice in both groups, and control group given no material)	Long-term abstinence	0.91 (0.71, 1.17)
Self-help versus no self-help controls (face-to-face contact plus advice in both groups, and control group given leaflet/pamphlet)	Long-term abstinence	1.15 (0.77, 1.72)
Self-help versus all no self-help controls	Long-term abstinence	1.08 (0.97, 1.21)

Table 6: Review – Lancaster and Stead, 2001b – Self-help interventions for smoking cessation

Comparison	Outcome	OR (95% CI)
Self-help plus NRT versus NRT alone	Long-term abstinence	0.94 (0.67, 1.31)
Self-help plus additional written material versus self-help alone	Long-term abstinence	1.02 (0.85, 1.22)
Self-help plus additional video material versus self-help alone	Long-term abstinence	0.70 (0.38, 1.31)
Self-help plus material tailored to broad characteristics or stage of change versus self-help with standard material	Long-term abstinence	1.13 (0.85, 1.50)
Self-help plus material tailored to individual characteristics or stage of change versus standard or stage matched material	Long-term abstinence	1.41 (1.14, 1.75)
Self-help plus additional availability of hotline versus self-help alone	Long-term abstinence	1.67 (1.11, 2.52)
Self-help plus additional telephone follow-up versus self-help alone	Long-term abstinence	1.62 (1.33, 1.97)

Table 7: Review – White et al., 2000 – Acupuncture for smoking cessation

Comparison	Outcome	OR (95% CI)
Acupuncture versus sham acupuncture	Early smoking cessation	1.22 (0.99, 1.49)
Acupuncture versus sham acupuncture	6 month smoking cessation	1.38 (0.90, 2.11)
Acupuncture versus sham acupuncture	12 month smoking cessation	1.02 (0.72, 1.43)
Acupuncture versus other intervention controls	Early smoking cessation	0.80 (0.62, 1.02)
Acupuncture versus other intervention controls	6 month smoking cessation	1.11 (0.63, 1.94)
Acupuncture versus other intervention controls	12 month smoking cessation	0.76 (0.54, 1.08)
Acupuncture versus no treatment controls	Early smoking cessation	5.88 (2.66, 13.01)
Acupuncture versus no treatment controls	6 month smoking cessation	0.99 (0.30, 3.24)
Acupuncture versus no treatment controls	12 month smoking cessation	2.44 (1.15, 5.20)

Table 8: Review – White et al., 2000 – Acupuncture for smoking cessation

Comparison	Outcome	OR (95% CI)
Non-auricular points acupuncture versus all controls	Early smoking cessation	1.12 (0.91, 1.38)
Non-auricular points acupuncture versus all controls	6 month smoking cessation	1.56 (0.77, 3.17)
Non-auricular points acupuncture versus all controls	12 month smoking cessation	0.82 (0.60, 1.12)
Auricular acupuncture versus all controls	Early smoking cessation	1.08 (0.75, 1.55)
Auricular acupuncture versus all controls	6 month smoking cessation	1.00 (0.54, 1.84)

Notes