

**NICE RAPID REVIEW**

**Interventions to Prevent the Uptake of Smoking in  
Children and Young People**

**Full Report**

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## Executive Summary

**Introduction and aims:** This review examines the effectiveness of: (a) mass media interventions designed to prevent the uptake of smoking in children and young people and (b) interventions that are designed to prevent the illegal sale of tobacco to children and young people. The review considers specific sub-questions related to the factors that might influence effectiveness, any differential effects for different audiences, and barriers and facilitators to implementation.

**Method:** A comprehensive literature search was conducted. 7365 titles and abstracts were screened, from which 105 papers were selected for further review. From these papers, 60 (40 mass media studies and 20 access restriction studies) were identified as providing direct evidence related to the questions of interest. The quality of these papers was assessed and the relevant data extracted. Key informant interviews (n=10) were also conducted to gain additional insight into mass media interventions. Key informants were not asked about interventions to prevent the illegal sale of tobacco to children and youth.

### Findings:

#### ***Mass Media Interventions***

##### ***Are mass media interventions effective in preventing the uptake of smoking in children and young people?***

Overall, there is evidence on many of the research questions posed for this review. In many cases the quality of this evidence is high (++) or medium (+). Key outcomes used to determine the effectiveness of mass media interventions in the identified literature include changes in attitudes, beliefs, intentions, behaviours (i.e. reducing smoking “cutting back,” quitting) or perceptions. Yet, there is a lack of information regarding some specific research questions. Additionally, not all of the evidence identified led to consistent findings. However, data indicates that mass media interventions can influence the knowledge, attitudes, beliefs and behaviours about the consequences of smoking among children and young people.

**Overarching Evidence statement:** There is evidence that mass media campaigns can prevent the uptake of smoking and also influence knowledge, attitudes and intentions of children and young people. Factors that have been shown to influence effectiveness in terms of attitudes, perceptions, beliefs and intentions include message source, message content, message format, message framing, duration, target audience, demographics of the audience, and the site/setting of the campaign. Factors that have been shown to influence effectiveness in terms of smoking behaviour (i.e. smoking in the past 30 days, decreased initiation of smoking, quitting, number of cigarettes smoked) include message content, target audience, duration of the mass media campaign, demographics of the audience, the number of anti-tobacco message sources and the TRUTH campaign. Overall, the factors outlined above work best when combined with broader tobacco control initiatives produced by tobacco control bodies. Furthermore, campaigns are most effective when they are long in duration and greater in intensity of exposure.

##### ***When appropriate interventions can be compared, which are most effective?***

Some mass media interventions are more effective than others. Comparing interventions, prevention campaigns produced by the tobacco industry are less effective than anti-tobacco campaigns produced by tobacco control bodies. Youth

perceive industry campaigns to be less effective, less interesting and less engaging. Industry campaigns also increase sympathy towards tobacco companies and interest in smoking.

**Evidence Statement 1:** Evidence from one cluster RCT (++)<sup>1</sup> suggests that adolescents perceive tobacco industry sponsored advertisements less favourably and as less effective (i.e. participants rated these ads as less convincing and less helpful in keeping friends from smoking and starting smoking) in reducing smoking (specifically, fewer people taking up smoking based on the following outcome measures: intention to smoke, curiosity of tobacco use, tobacco industry sympathy) than other smoking prevention advertisements, but also express greater sympathy with the tobacco companies after viewing their advertisements. Yet, neither the industry sponsored nor other prevention ads changed adolescent's intention to smoke.

One cross-sectional (+)<sup>2</sup> study found that an American tobacco control campaign did increase anti-tobacco attitudes and beliefs, while an industry-sponsored campaign encouraged an interest in smoking. Similarly, one cross sectional study (++)<sup>3</sup> found that exposure to tobacco company youth-targeted smoking prevention advertising generally had no beneficial outcomes (measured by young people's attitudes, beliefs and intentions regarding the tobacco industry, and tobacco use ten months into the "truth" campaign) for youth. Exposure to tobacco company parent-targeted advertising was associated with lower perceived harm of smoking, stronger approval of smoking, stronger intentions to smoke in the future and greater likelihood of having smoked in the past 30 days. Another (+)<sup>4</sup> US-based cross sectional study found that tobacco industry ads were less interesting, less cognitively engaging, and held less negative emotional appeal for teenagers than ads created by tobacco control programs.

1. Henriksen et al., 2006 (Cluster RCT ++) USA
2. Farrelly et al., 2002 (Cross Sectional +) USA
3. Wakefield et al., 2006 (Cross Sectional ++) USA
4. Wakefield et al., 2005 (Cross-sectional +) USA

Applicability: All of the studies took place outside of the UK. It is unclear whether their findings are applicable to the UK given the fact that the mass media interventions are specific to the USA and the demographics of participants do not reflect that of the UK.

***Are the interventions delaying rather than preventing the onset of smoking?***

It is not clear whether mass media interventions are delaying rather than preventing the uptake of smoking in children and youth. No studies identified in the literature examined this question.

**Evidence statement 2:** No studies included in the review examined whether mass media interventions are delaying rather than preventing smoking uptake in children and youth.

***How does the way that the intervention is delivered influence effectiveness?***

The way in which an intervention is delivered does influence effectiveness. However, effectiveness is dependent on a number of factors including message content, mode of delivery, target audience, message framing and message elements.

**Evidence statement 3:** How an intervention is delivered does influence the attitudes, perceptions and behaviours of young people. Evidence from two (+)<sup>1,2</sup> reviews found that message content does influence the effectiveness (see below) of an intervention, though the impact is not consistent, and also depends on the duration of delivery. One (++)<sup>3</sup> RCT study found that message content could change perceptions of health risk severity and intentions not to smoke, though none of the message themes resulted in: increased self-efficacy for refusing cigarette offers or resisting tobacco marketing, or improved health risk vulnerability. Another (++)<sup>4</sup> RCT study found that using tobacco related disease messaging was more effective for increasing anti-tobacco attitudes, whereas anti-industry ads did not decrease young peoples intention to smoke.

Evidence from a US cross-sectional (+)<sup>5</sup> study found that 'truth' messages were effective in decreasing and preventing smoking in youth (Florida teens were less likely to smoke in the past 30 days, to have ever tried smoking, or to indicate that they could not rule out the possibility of smoking in the future).

A UK-based (++)<sup>6</sup> qualitative study found that social norms messages were more effective than fear messages at encouraging more committed smokers to consider their smoking behaviours and reinforcing awareness of the dangers of smoking in less committed smokers. Industry manipulation ads were aesthetically appealing but ineffective for preventing the uptake of smoking. Similarly, one (+)<sup>7</sup> review and one RCT (+)<sup>8</sup> study conclude that anti-smoking ads can improve smoking prevention and cessation in youth (by making youth less likely to smoke, have lower intentions to smoke, and have greater intentions to quit smoking), but the specific outcomes of any message type depends on the context and the values that the audience associates with smoking.

1. Wakefield et al., 2003 (Review +) International
2. Schar et al., 2005 (Review +) USA
3. Pechmann et al., 2003 (RCT ++) USA
4. Pechmann et al., 2006 (RCT++) USA
5. Niederdeppe et al., 2004 (Cross -sectional +) USA
6. Devlin et al., 2007 (Qualitative ++) UK
7. Friend et al., 2002 (Review +) USA
8. Smith et al., 2006 (RCT +) USA

Applicability: Most of the studies were conducted in the USA. It is not clear if these findings are directly applicable to the UK since the mass media campaigns under investigation are specific to the USA. Furthermore, demographics of participants are different from those in the UK. International review data may be broadly applicable to the UK since the review is international in scope.

**Evidence statement 4:** Studies included in the review analysed the effectiveness of a variety of mass-media formats. One cross-sectional (-)<sup>1</sup> study found that television ads were recalled more often than other formats

and that viewing the ads increased intention to quit, though did not affect actual quit attempts. Evidence from one qualitative (+)<sup>2</sup> study indicates that youth deemed websites as effective in obtaining information on smoking, if they incorporated: interactivity, expert-trusted guidance, and appealing graphics. One (+)<sup>3</sup> cross-sectional study reveals that youth organising movements and intensive counter-marketing media campaigns can be effective in preventing the uptake of smoking and fostering anti-tobacco industry beliefs among youth.

1. Seghers et al., 1998 (Cross-sectional -) USA
2. Parlove et al., 2004 (Qualitative +) USA
3. Dunn et al., 2004 (Cross-sectional +) USA

**Applicability:** All three studies were conducted in the USA. Given that the findings are in response to specific USA interventions it is not clear if findings are applicable to the UK.

**Evidence statement 5:** Evidence from one cross-sectional (+)<sup>1</sup> study and one (+)<sup>2</sup> review suggest that adult-focused or general population campaigns are successful for reducing smoking (cutting down the number of cigarettes smoked, increasing numbers of youth attempting to quit, making it easier to stay a non-smoker) in youth. Yet, one (+)<sup>3</sup> review contends that both youth and general-oriented messaging can be effective in developing awareness, and changing attitudes and behaviours associated with tobacco use, as long as messages are not deemed patronising by youth.

1. White et al., 2003 (Cross-sectional +) Australia
2. Friend et al., 2002 (Review +) USA
3. Schar et al., 2005 (Review +) USA

**Applicability:** No studies were conducted in the UK. It is not clear if findings are directly relevant to the UK context.

**Evidence statement 6:** One RCT (+) found that message framing impacts the effectiveness of an intervention by lowering intentions to smoke, lowering the perceived pharmacological benefits of smoking, and lowering the perceived psychological benefits of smoking. In particular, it is important that the message framing is consistent with the desired outcome.

1. Kim 2006 (RCT +) South Korea

**Applicability:** Given the broad cultural differences between South Korea and the UK the findings of this study are likely less relevant to the UK.

**Evidence statement 7:** One (+)<sup>1</sup> review contends that effective messaging should attend to all message elements. Specifically, evidence from one cross-sectional (+)<sup>2</sup> study suggests that message processing in older teens improves when messages incorporate unrelated cuts and use suspenseful images. One cross-sectional study (+)<sup>3</sup> found sources were evaluated more positively for implicit rather than explicit messages, and for anti-smoking rather than pro-smoking messages. Evidence from a RCT (++)<sup>4</sup> study reveals

that youth exposure to cigarette ads depicting youth can decrease negative stereotypic beliefs about smoking and increase intention to smoke.

1. Schar et al., 2005 (Review +) USA
2. Niederdeppe, 2005 (Cross-sectional +) USA
3. Grandpre et al., 2003 (Cross-sectional +) USA
4. Pechmann et al., 2002 (RCT ++) USA

Applicability: The demographics of study participants and the mass media interventions under investigation are specific to the USA. It is not clear if findings are applicable to the UK.

***Does effectiveness depend on the status of the person (e.g., peer, parent or teacher) delivering it?***

There was a lack of information regarding whether the effectiveness of a mass media intervention depends on the status of the person delivering it. However, evidence indicates that youth who receive anti-smoking messages from a variety of sources (eg family, friends, internet, sporting events), as opposed to only a few, are more likely to refuse tobacco.

**Evidence statement 8:** No studies specifically discussed how the status of a person delivering an intervention can have an impact on its effectiveness. Yet, one cross sectional study (+)<sup>1</sup> and one (+)<sup>2</sup> review reveal that youth who are exposed to a large variety of anti-tobacco sources are more likely to refuse tobacco, and that social interactions can support anti-tobacco messaging. Evidence from two cross sectional studies (+)<sup>3,4</sup> indicates that the tobacco industry is not a trusted source of information among young people.

1. Reinert et al., 2004 (Cross-sectional +) USA
2. Wakefield et al., 2003 (Review +) International
3. Hersey et al., 2003 (cross sectional +) USA
4. Farrelly et al., 2002 (cross sectional +) USA

Applicability: It is not clear if findings are directly applicable to the UK since they are USA based. However, international review data may be broadly applicable.

***Does the site/setting influence effectiveness?***

Site/setting may influence the effectiveness of an intervention. Although there was limited information on this topic, youth who are exposed to anti-tobacco messages in urban settings are more likely to report that interventions influenced their personal choice to use tobacco and to think about the dangers of tobacco. Mass media advertisements delivered during movies may also influence smoking attitudes and behaviours (more specifically perceptions of smoking in movies and intentions to smoke).

**Evidence statement 9:** Site/setting does influence effectiveness of an intervention. Evidence from one (-)<sup>1</sup> cross-sectional study suggests that suburban, urban and rural youth interpret and respond to anti-tobacco messages differently. Suburban and urban youth are more likely to report increased perceptions of the danger of tobacco use. One Australian based (+)<sup>2</sup> non-RCT study found that including anti-smoking advertisements during a movie increased disapproval of smoking in movies. Youth who were



smokers did not demonstrate any change in approval, but did express a desire to quit after the intervention.

1. Zollinger et al., 2006 (Cross-sectional -) USA
2. Edwards et al., 2004 (Non-RCT +) Australia

Applicability: Given the differences in demographics of study participants and the interventions under investigation it is not clear if findings are directly applicable to the UK.

***Does the intensity of the intervention influence effectiveness or duration of effect?***

The duration of a mass media intervention influences its effect. Increased exposure to anti-tobacco messages over time decreases intent to smoke and smoking initiation, meanwhile increasing negative attitudes towards the tobacco industry.

**Evidence statement 10:** Evidence from one (++)<sup>1</sup> Cochrane review suggests that the duration of an intervention will have the greatest bearing on health behaviours. In support of this, evidence from four cross-sectional studies (two ++, and two +)<sup>2,3,4,5</sup> identified by the literature search reveals that increased exposure to anti-smoking ads over time results in a decrease in: youth smoking in the past 30 days (compared to those in markets with no exposure to state-sponsored anti-tobacco laws), intent to smoke, initiation of smoking, enhanced perception of risk, and negative attitudes about smoking.

Similarly, two cross-sectional (+)<sup>6,7</sup> US studies demonstrate that young people living in states with aggressive counter-industry media campaigns are more likely to have negative beliefs about tobacco industry practices, are less likely to smoke, and are more informed about the dangers of second-hand smoke. As well, one (+)<sup>8</sup> cohort study found that pro-tobacco media increased susceptibility to smoking, while anti-tobacco media decreased susceptibility. Conversely, one (++)<sup>9</sup> US-based cross-sectional study did not find a relationship between exposure to anti-smoking campaign and improved ideas about smoking or health behaviours. They argue that in order to be effective, exposure must be supported by other tobacco control initiatives.

1. Sowden et al., 1998 (Review ++) International
2. Johnston et al., 2005 (Cross-sectional ++) USA
3. Murray et al., 1994 (Cross-sectional ++) USA
4. Emery et al., 2005 (Cross-sectional +) USA
5. Popham et al., 1994 (Cross-sectional +) USA
6. Hersey et al., 2003 (Cross-sectional +) USA
7. Hersey, Niderdeppe, et al., 2005 (Cross-sectional +) USA
8. Weiss et al., 2006 (Cohort study +) USA
9. Sly et al., 2002 (Cross-sectional ++) USA

Applicability: None of the studies were conducted in the UK. However, given the nature of exposure to mass media campaigns findings may be applicable to the UK.

**Evidence statement 11:** Results from four cross-sectional studies (two ++, and two +)<sup>1,2,3,4</sup> indicate that the TRUTH campaign was successful in improving the prevention of youth smoking over time. Studies show that the

campaign resulted in: decreased prevalence of smoking in youth, greater agreement with anti-smoking statements by youth, and stronger anti-tobacco attitudes and beliefs.

1. Farrelly et al., 2005 (Cross-sectional ++) USA
2. Sly et al., 2001 (Cross-sectional ++) USA
3. Farrelly et al., 2002 (Cross-sectional +) USA
4. Hersey et al., 2005 (Cross-sectional +) USA

Applicability: The TRUTH campaign is a specific USA anti-tobacco mass media campaign. Due to the nature of the campaign and the demographics of US young people, results are not directly relevant to the UK.

***How does effectiveness vary according to the age, sex, socio-economic status or ethnicity of the target audience?***

Effectiveness may vary according to a variety of demographic factors. Mass media campaigns appear to benefit younger youth more than their older counterparts. However, findings regarding the impact of sex and ethnicity are inconclusive. Mass media messages and themes are received differently depending on age, sex, and ethnicity. There was a lack of information regarding the impact of socio-economic status. A variety of other individual characteristics can also impact effectiveness.

**Evidence statement 12:** Several studies discuss sex and gender based differences in the effectiveness of media interventions. One RCT (+)<sup>1</sup> found that for girls, cosmetic ads had a greater impact on smoking behaviour (including how often girls smoke, how long they have been smoking for and the number of cigarettes smoked) and intentions to quit; while health ads had a greater impact on smoking behavior (including how often boys smoke, how long they have been smoking for and the number of cigarettes smoked) and intentions to quit for boys. Health ads were also most useful for reducing girls and boy's intention to start smoking. Evidence from one (+)<sup>2</sup> cohort study found that over time, boys were more susceptible (expressed greater interest in smoking uptake) to smoking than girls. One (+)<sup>3</sup> cross-sectional study found no gender differences in the effectiveness of an anti-smoking campaign. A cross-sectional (-)<sup>4</sup> study found that while awareness was similar for girls and boys, girls had a greater recall of anti-tobacco messaging. In a (+)<sup>5</sup> cross-sectional study based in Norway, girls demonstrated a stronger behavioral response (reporting that the campaign had affected their beliefs or decisions concerning smoking) to an anti-smoking media campaign.

1. Smith et al., 2006 (RCT+) USA
2. Weiss et al., 2006 (Cohort +) USA
3. Shegog et al., 2005 (Cross-Sectional +) USA
4. Zollinger et al., 2006 (Cross-sectional -) USA
5. Hafstad et al., 1996 (Cross-sectional +) Sweden

Applicability: None of these studies were conducted in the UK. It is not clear if the findings are directly relevant, as gender is culturally defined and prescribed.

**Evidence statement 13:** Evidence from one review (+)<sup>1</sup>, one US-based cohort study (+)<sup>2</sup>, and three cross-sectional (one++, one +, and one-)<sup>3,4,5</sup> studies reveals that for younger youth, media campaigns are more likely to

decrease intentions to smoke and improve smoking behavior by decreasing initiation rates and continuation of current smoking. Similarly, one review (+)<sup>6</sup> suggests that older youth are less affected by anti-tobacco industry campaigns since they have the least awareness of, and receptivity to, mass media messages. In order to target this group, they suggest using campaigns that appeal to the general population, rather than just youth.

Conversely, one cross-sectional study (+)<sup>7</sup> found that older youth demonstrated greater change in behavioural intentions after exposure to a media campaign. As well, one cross-sectional (+)<sup>8</sup> study testing emotional reactions to smoking ads, only found a weak relationship between age and response.

Evidence from one RCT study (+)<sup>9</sup> found that message content differentially impacts the outcomes of the campaign (how often youth smoke, number of cigarettes smoked, intentions to start smoking, and intentions to quit), depending on the age of the students. In general, health messages were more effective in changing smoking behavior (how often youth smoke, how long they have been smoking, and the number of cigarettes smoked), intention to start smoking and intention to quit smoking for older students, while cosmetic messages were more effective in changing smoking behavior (how often youth smoke and the number of cigarettes smoked) for younger students. In another RCT (+)<sup>10</sup> study, the investigators also concluded that age and message types have a statistically significant impact on the interpretation of tobacco-related messages. Older youth were less likely to positively accept *explicit* anti or pro tobacco messages that limited their internalized decision making, compared to younger children.

1. Wakefield et al., 2003 (Review +) International
2. Siegel et al., 2000 (Cohort study +) USA
3. Johnston et al. (Cross-sectional ++) USA
4. Sly, Hopkins, et al., 2001 (Cross-Sectional +) USA
5. Zollinger et al., 2006 (Cross-Sectional -) USA
6. Schar et al., 2005 (Review +) USA
7. Shegog et al., 2005 (Cross-sectional +) USA
8. Wakefield et al., 2005 (Cross-sectional +) USA
9. Smith et al., 2006 (RCT +) USA
10. Grandpre et al., 2003 (RCT+) USA

Applicability: None of these studies were conducted in the UK. It is not clear if findings are directly relevant.

**Evidence statement 14:** A variety of studies explored the impact of ethnicity on the effectiveness of youth interventions. One (++)<sup>1</sup> cross-sectional study revealed that African Americans and Hispanics were more affected (defined as the level to which youth report advertising has made them less likely to smoke cigarettes) by anti-smoking messaging than White youth. Evidence from one cross-sectional (+)<sup>2</sup> study found no relationship between ethnicity and emotional reaction to anti-smoking messages. Finally, one (+)<sup>3</sup> cross-sectional study found that a web based tobacco prevention programme had a greater impact on intentions not to smoke among Hispanic and White students than Black students.

1. Johnson et al., 2005 (Cross-sectional ++) USA

2. Wakefield et al., 2005 (Cross-sectional +) USA
3. Shegog et al., 2005 (Cross-sectional +) USA

Applicability: As these studies deal with specific populations in the USA, it is unclear how applicable these findings are to a UK setting.

**Evidence statement 15:** One cross-sectional (+)<sup>1</sup> study found that a number of variables were associated with a greater intention to smoke, including: brand recognition, willingness to use or wear products with tobacco brands, stress and having friends who smoke. Having a live-in father who smoked, and agreeing with anti-tobacco ads were both associated with a lesser intention to smoke. Evidence from one cross-sectional (+)<sup>2</sup> study found that youth who smoked demonstrated a greater awareness of the pervasiveness of anti-smoking campaigns than among youth who had never smoked or who were susceptible to smoking.

1. Straub et al., 2003 (Cross-sectional +) USA
2. Unger et al., 2001 (Cross-sectional +) USA

Applicability: Since neither of the studies were conducted in the UK it is not clear if findings are directly relevant.

#### ***What are the facilitators and barriers to implementation?***

Lack of exposure and longevity are barriers to effective mass media interventions.

**Evidence statement 16:** No studies specifically examined facilitators or barriers to the implementation of mass media interventions. Yet, two (+)<sup>1,2</sup> reviews suggest that mass media interventions are most effective when they are longer in duration and greater in intensity of exposure. Schar et al. cites the guidelines developed by the former Chief of the Health Communications Branch at the Center of Disease Control (CDC) in the U.S. According to these guidelines, ads should be aired for a minimum of 6 months to affect awareness and up to 24 months to have an impact on behaviors; ads should also be aired as continuously as possible, particularly within the first 6 months of a campaign. Lantz contends that mass media interventions should be large, intense and of "sufficient duration" but does not explicitly define the terms duration or intensity.

1. Schar et al. 2005 (review +) USA
2. Lantz 2000 (review +) USA

Applicability: Both studies were conducted in the USA. However, given the nature of exposure to mass media campaigns findings may be applicable to the UK.

#### ***How would differences between the comparators used in published studies and the prevailing situation in England impact on the analysis of effectiveness?***

The majority of studies identified by the literature were conducted in the USA. Many of these studies examined the effectiveness of interventions specific to the USA, such as the TRUTH campaign. In addition to USA based studies, many of the reviews identified by the literature search were international in scope. Findings from

these reviews may be more relevant to the UK since they review international evidence and are likely applicable to a variety of contexts. Key informants expressed concerns about applying international evidence about mass media to a UK context. In particular, they discussed some of the significant social and cultural differences that create challenges when trying to apply international data.

**Evidence statement 17:** It is not clear whether the results of the literature identified will be directly applicable to the UK. The majority of studies reviewed were based in the USA. However, some important generic lessons can likely be transferred across continents. To determine the effectiveness of youth access restrictions in the UK, more UK specific research is needed.

### ***Key Informant Interviews***

The key informants (from five countries) provided a wealth of insight into mass media interventions from a range of perspectives (See Appendix E). However, there was no firm or consistent opinion regarding many of the research questions. For example, informants were unclear about how site/setting and intensity/duration affect campaign effectiveness. Furthermore, key informants were uncertain about whether campaigns are delaying rather than preventing the uptake of smoking in children and youth. However, key informants did agree that campaign effectiveness is affected by a variety of barriers and demographic factors. Overall, while key informants expressed diverse opinions about the effectiveness of mass media campaigns it was recognised that, in order to be successful, mass media interventions need to be part of broader tobacco control programmes.

### ***Access Restrictions***

#### ***Which interventions are effective in reducing the illegal sale of tobacco to children and young people?***

Overall, there is evidence on many of the research questions addressing the effectiveness of access restriction interventions. In many cases this evidence is of high (++) or medium quality (+) and led to consistent findings. However, nearly all of the studies looked at the effect of interventions on illegal sales (eg number of sales to youth, merchant compliance) rather than behaviour or prevention of uptake. One study by Fichtenburg et al. (2002) did address the impact of access restrictions on smoking behaviours but found no relationship between merchant compliance and smoking prevalence. Another study by Fitchenburg examined the impact of access restrictions on stage of smoking uptake. Findings revealed that compliance with access laws reduced the likelihood of being in a higher stage of smoking uptake. As a result, it is not clear what impact access restrictions are having on smoking behaviours. It is also important to note that there is limited evidence outlining whether interventions are delaying, and/or preventing smoking uptake among children and youth.

**Overarching Evidence statement:** There is evidence that access restriction interventions impact effectiveness in terms of the number of sales to young people, young people's ability to access cigarettes and merchant compliance. There was a lack of information regarding whether interventions impact behaviours, attitudes, beliefs, intentions or perceptions. Only two studies addressed the impact of interventions on smoking behaviour. Factors that have been shown to influence number sales, young people's ability to access cigarettes and merchant compliance include active enforcement,

comprehensive interventions, interventions produced by tobacco control bodies, requesting age/proof of ID, demographics of the vendor/merchant, site setting of the access intervention, and the demographics of the target audience. Overall, the factors outlined above work best when combined with requesting proof of age/ID, active enforcement (in relation to both retailer-youth purchaser and trading standards-retailers) and other youth prevention strategies.

***When appropriate interventions can be compared, which are most effective?***

Some access restrictions appear to be more effective than others. Compared to interventions created by tobacco control bodies, interventions produced by the tobacco industry do not decrease the sale of tobacco to youth. Merchants participating in the tobacco industry intervention were still willing to illegally sell tobacco to children even after warnings were issued.

**Evidence Statement 18:** One cross sectional (–)<sup>1</sup> article found that a tobacco industry sponsored campaign within the US did not significantly reduce the sale of tobacco to minors, yet state mandated warnings were only slightly more successful in reducing youth’s ability to purchase tobacco. Tobacco industry interventions may not prevent the illegal sale of tobacco to children and youth; active enforcement of tobacco sales laws by health officials may be more effective.

1. Di Franza et al., 1992 (Cross-Sectional -) USA

Applicability: Findings are not applicable to the UK since the findings are specific to a US-based tobacco industry campaign.

***Are the interventions delaying rather than preventing the onset of smoking?***

It is not clear if access interventions are delaying rather than preventing the uptake of smoking among children and youth. When faced with restrictions, youth appear to acquire tobacco from non-retail sources such as family members or peers. As a result, it is not clear if interventions have a direct effect on smoking uptake or behaviour.

**Evidence statement 19:** No studies in the review examined whether interventions were delaying rather than preventing the onset of smoking. For the most part, studies identified examined the effect of access restrictions on illegal sales (eg number of sales to youth, merchant compliance) not the effect on behaviour or prevention of uptake. One US-based cross-sectional study (+)<sup>1</sup> did find that interventions impacted youth’s stage of smoking uptake. Stage of smoking uptake was rated on a continuum of 1 to 5, with stage 1 being someone who has never smoked and has no intention to smoke, and stage 5 being someone who currently smokes, has smoked at least 100 cigarettes and has no intention to quit. Evidence from this study suggests that compliance with youth access laws reduces the probability of being in higher stages of smoking. Youth who are in earlier stages of smoking depend more on social sources for acquiring tobacco. Interestingly, evidence from one American review (+)<sup>2</sup> shows no difference in youth smoking rates between communities with and without greater merchant compliance with sales restrictions.

1. Ross et al., 2006 (Cross-sectional +) USA
2. Fitchenburg et al., 2002 (review +) USA

Applicability: The findings are in relation to two US-specific interventions. It is not clear if findings are directly applicable to the UK.

***How does the way that the intervention is delivered influence effectiveness?***

The way in which an intervention is delivered does influence effectiveness. There is strong evidence that comprehensive interventions are more effective than individual restrictions alone. Furthermore, active enforcement and requesting age/ID can also decrease sales of tobacco. Similar findings were highlighted from English survey data.

**Evidence statement 20:** One (++)<sup>1</sup> Cochrane review and one US- based cross-sectional study (+)<sup>2</sup> found that multi-faceted interventions (active enforcement, multi-component educational strategies, and increased taxing and restrictions on smoking in public places respectively) are most effective for reducing youth's ability to access tobacco, particularly when combined with ongoing and active enforcement of minimum age restrictions. Similarly, English survey data indicates that a broad set of actions is the key to successfully increasing minimum age laws. Active law enforcement has been identified by one review (+)<sup>3</sup> and 2 cross sectional studies (-)<sup>4, 5</sup> as an important part of multi-component interventions. Evidence from one review (+)<sup>6</sup> suggests that vending machine policies are most effective at reducing youth access to tobacco when combined with locking devices or complete vending machine bans.

1. Stead et al., 2005 (review ++) International
2. Chaloupka et al., 1996 (cross sectional +) USA
3. Lantz et al., 2002 (review +) USA
4. Tutt et al., 2000 (cross sectional -) Australia
5. Price, 1998 (cross sectional -) New Zealand
6. Levy et al., 2002 (review +) USA

Applicability: The majority of the studies took place outside of the UK in a wide range of countries, including Australia, the USA and New Zealand. However, it is likely that their findings are applicable to the UK, given the broad similarities in the impact of enforcement.

**Evidence statement 21.** Two cross-sectional (+)<sup>1,2</sup> US-based studies found that when merchants requested proof of age, illegal sales decreased. There is some evidence that asking for identification decreases illegal sales more than asking for age. Yet evidence from a non-RCT study (+)<sup>3</sup> in the US suggests that minors who present ID are more successful when purchasing tobacco than those who do not. Therefore, while cashier compliance with enforcing age restrictions can decrease youth's ability to purchase tobacco, evidence suggests that this will be most effective when stringent verification of ID occurs.

1. Landrine et al., 1996 ( Cross-sectional +) USA
2. DiFranza et al., 2001 (Cross-sectional +) USA
3. Levinson et al., 2002 (non-RCT +) USA

Applicability: Since none of these studies were conducted in the UK it is not clear if findings are directly applicable to the UK.

***Does effectiveness depend on the status of the person (e.g., peer, parent or teacher) delivering it?***

The status of the person delivering an access restriction does impact effectiveness. The age, gender and ethnicity of shop assistants selling tobacco appear to influence sales to youth.

**Evidence statement 22:** In one cross sectional study (+)<sup>1</sup>, clerks participating in a compliance program were as likely to make illegal sales of tobacco to youth as clerks who were not participating in the compliance program. However, US-based evidence from one (+)<sup>2</sup> non-RCT and two cross-sectional (+)<sup>3,4</sup> studies suggests that the age, gender and ethnicity of the person delivering an intervention influences the outcomes. Overall, younger merchants are more likely to sell tobacco illegally to a minor, identification is less likely to be requested and an illegal sale is more likely to occur when the merchant is a man. Some evidence also suggests that ethnicity may influence intervention outcomes; Asian clerks were found more likely to request age, with White clerks most often requesting identification.

1. DiFranza et al., 1996 (Cross-sectional +) USA
2. Levinson et al., 2002 (non-RCT +) USA
3. DiFranza et al., 2001 (Cross-sectional +) USA
4. Landrine et al., 1996 (Cross-sectional +) USA

Applicability: All four studies were conducted in the USA. It is not clear if findings are applicable to the UK.

***Does the site/setting influence effectiveness?***

Evidence shows that site/setting does influence effectiveness. Based on English survey data youth are successful at buying tobacco in a variety of locations including newsagents, tobacconists or sweet shops. Similar findings were highlighted by US studies which found that youth buy cigarettes from convenience stores, gas stations and food stores.

**Evidence statement 23:** Evidence shows that site/setting does influence the effectiveness of the intervention, and youth's ability to purchase tobacco. Evidence from one cross sectional (+)<sup>1</sup> study in Sweden indicates that younger looking adolescents were most successful when purchasing tobacco in newsstands, tobacco shops, and service stations (compared to department stores, grocery stores, cafes, restaurants, and video rental shops). Survey data from England indicates that older youth are more successful at purchasing cigarettes than their younger counterparts. Another cross sectional study (++)<sup>2</sup> in the US found that minors were most successful at purchasing tobacco in convenience stores, followed by gas stations and food stores. Survey data from England similarly indicates that youth often buy cigarettes from newsagents, tobacconists or sweet shops. The availability of tobacco vending machines also influences access to tobacco. Two (+)<sup>3,4</sup> cross sectional studies based in the US, found that youth were more successful when purchasing tobacco from unlocked vending machines or self-service displays than from locked vending machines or over-the-counter outlets.

1. Sundh et al., 2004 (Cross-sectional +) Sweden



2. Glanz et al., 2007 (Cross-sectional ++) USA
3. DiFranza et al., 2001 (Cross-sectional +) USA
4. DiFranza et al., 1996 (Cross-sectional +) USA

Applicability: All four studies took place outside of the UK. However, it is likely that their findings are applicable to the UK given the broad similarities in the locations where young people purchase cigarettes.

***Does the intensity of the intervention influence effectiveness or duration of effect?***

The duration of access restrictions may impact effectiveness. There is some evidence that compliance with access restrictions increases over time. However, effectiveness may not be self-sustainable and may be impacted by social sources of tobacco.

**Evidence statement 24:** No studies in the review directly studied the intensity of interventions, though some did examine the impact of an intervention over time. Evidence from two (+)<sup>1,2</sup> cross-sectional studies indicate that over time (between 2001-2003, and between 1996-2005 respectively) factors such as successive retail inspections, public prosecutions, awareness of campaigns and implementing a minimum age law result in decreased illegal sales of tobacco. Yet, evidence from one (+)<sup>4</sup> review demonstrates that access restrictions on purchasing tobacco do not impact smoking behaviour, suggesting that decreased access to buying cigarettes doesn't necessarily result in a decrease in smoking. Lastly, according to evidence from a (+)<sup>4</sup> empirical review, interventions may not produce a sustained decrease in the illegal sale of tobacco. The authors do not specify the impact of the interventions on duration of effect; they only state that interventions without compliance checks, significant penalties, and merchant awareness have limited long-term effects.

1. Tangirala et al. 2006 (Cross-sectional +) USA
2. Sundh et al., 2006 (Cross-sectional +) Sweden
3. Fichtenburg et al., 2002 (Review +) USA
4. Levy et al., 2002 (Review +) USA

Applicability: All four studies to place outside of the UK. As a result, it is not clear if findings are directly applicable.

***How does effectiveness vary according to the age, sex, socio-economic status or ethnicity of the target audience?***

The effectiveness of access restrictions is affected by a variety of demographic variables. Older youth and more established smokers (who are also likely older) are more successful at purchasing tobacco. Although there were mixed findings regarding the impact of sex, findings from a strong piece of evidence indicate that boys are more successful than girls at purchasing tobacco. However, English survey data indicates that girls are more likely to try and buy cigarettes. However, refusal rates, and therefore purchasing success rates, are similar for boys and girls. The ethnicity of youth influenced whether or not age/ID was requested. There was a lack of information regarding the impact of socio-economic status.

**Evidence statement 25:** Access restrictions on the sale of tobacco have an impact on smokers in different ways, depending on their age and smoking

status. Evidence from 1 (++)<sup>1</sup> Cochrane review and 1 cross sectional (++)<sup>2</sup> reveals that regular smokers encounter access restrictions on the sale of tobacco more frequently, but also employ more techniques to obtain cigarettes—such as presenting fake ID or lying about their age. One US-based cross sectional (-)<sup>3</sup> study found that retailer compliance resulted in the greatest decrease in smoking behaviour for younger and less experienced smokers. For example, the number of regular smokers decreased, the number of youth reporting at least monthly smoking decreased and the frequency of smoking decreased. Similarly, there is some US-based evidence from one (+)<sup>4</sup> cross sectional study and a (+)<sup>5</sup> non-randomised controlled trial study that older youth are more successful in purchasing tobacco. Some evidence also suggests that youth's age of appearance affects their ability to purchase tobacco. Two (+)<sup>6,7</sup> cross-sectional studies and survey data from England found that youth who appear older are more successful in purchasing tobacco than younger looking youth.

1. Stead et al., 2005 (Review ++) International
2. Glanz et al., 2007 (Cross-sectional ++) USA
3. Tutt et al., 2000 (cross-sectional -) Australia
4. DiFranza et al., 2001 (cross-sectional +) USA
5. Levinson et al., 2002 (non-RCT +) USA
6. Sundh et al., 2004 (Cross-sectional +) Sweden
7. DiFranza et al., 1996 (Cross-sectional +) USA

Applicability: Although all of these studies took place outside of the UK, it is likely that their findings are applicable to the UK, given the outcomes being measured.

**Evidence statement 26.** Evidence from one US cross-sectional study (++)<sup>1</sup> found that males had greater purchasing success rates. English survey data indicates that girls try to purchase cigarettes more than boys however refusal rates, and therefore purchasing success rates, are similar. Evidence from two (+)<sup>2,3</sup> Swedish cross-sectional studies indicate that boys were more successful in purchasing tobacco, both before and after minimum age restrictions were applied. Conversely, one US (+)<sup>4</sup> cross sectional study suggests girls are more successful in buying tobacco and one (+)<sup>5</sup> cross sectional study found that girls were more frequently asked to present ID when attempting to buy cigarettes. Some evidence also suggests that requesting ID results in the greatest reduction of girl's access to purchasing cigarettes.

1. Glanz et al., 2007 (Cross-sectional ++) USA
2. Sundh et al., 2004 (Cross-sectional +) Sweden
3. Sundh et al., 2005 (Cross-sectional +) Sweden
4. DiFranza et al., 1996 (Cross-sectional +) USA
5. Landrine et al., 1996 (Cross-sectional +) USA

Applicability: All five studies took place outside of the UK. Furthermore, some evidence is not consistent with English survey data. Findings may not be directly relevant to the UK.

**Evidence statement 27:** Evidence indicates that ethnicity influences the ability to buy tobacco among young people. One US (+)<sup>1</sup> cross-sectional

study found that African American children, followed by Latino and White children respectively, were more likely to be asked for ID when attempting to purchase cigarettes. ID requests resulted in the greatest reduction of African American children's success in purchasing cigarettes. The authors do not indicate whether or not ID requests resulted in a reduction of purchasing success for Hispanic or White youths. One US-based (+)<sup>2</sup> cross sectional study found that tobacco policies impact youth differently. Evidence shows that smoking rates for white male youth are more responsive to anti-tobacco activities and clean indoor restrictions, while young black males are more influenced by smoking protection and youth access laws (i.e. purchasing restrictions).

1. Landrine et al., 1996 (Cross-sectional +) USA
2. Chaloupka et al., 1998 (Cross-sectional +) USA

Applicability: As these studies deal with specific populations in the USA, it is unclear how applicable these findings are to a UK setting.

### ***What are the facilitators and barriers to implementation?***

Acquiring tobacco from social sources and lack of enforcement are barriers to the effective implementation of access restrictions.

**Evidence statement 28:** Two key barriers to the implementation of access restrictions on purchasing tobacco were identified. Evidence from three (+)<sup>1,2,3</sup> reviews and one (++)<sup>4</sup> review indicates that access restrictions are impeded by a young person's ability to access tobacco products from social sources including friends, family, and strangers. UK Survey data reveals similar findings. Furthermore, evidence from one (+)<sup>5</sup> cross sectional study based in the USA shows that weak enforcement of laws and policies creates a barrier to the effective reduction of the number of youth smoking. In particular, minimum age restrictions are not well enforced.

1. Fichtenburg et al., 2002 (review +) USA
2. Backinger et al., 2003 (review +) USA
3. Levy et al., 2002 (review +) USA
4. Lantz et al., 2000 (Review ++) USA
5. Chaloupka et al., 1996 (Cross-sectional +) USA

Applicability: Although the studies were conducted in the USA, their results are likely to be broadly applicable to the UK setting.

### ***How would differences between the comparators used in published studies and the prevailing situation in England impact on the analysis of effectiveness?***

As with the mass media literature, the majority of studies addressing access restrictions were conducted in the US. It is not clear if the findings will be directly applicable to the UK due to the demographics of study participants and the nature of the access restrictions. In addition to US based studies, many of the reviews identified by the literature search were international in scope. Findings from these reviews may be more applicable to the UK since they review international evidence and are likely applicable to a variety of contexts. For example, evidence that is international in scope identified similarities in factors that influence access to cigarettes (including ability to purchase) such as the age of the young person and the

sources of cigarettes. For example, international evidence indicates that older youth are more successful than younger youth at purchasing cigarettes and that young people acquire cigarettes from a variety of social sources such as family and friends. Finally, no studies identified by the literature search examined the recent change in the minimum age law (from age 16 to 18). It is not known what impact this change will have. More studies conducted in the UK examining sales restrictions would allow for fuller analysis.

**Evidence statement 29:** It is not clear if the evidence reviewed is directly applicable to the UK. The majority of studies identified by the literature search were conducted in the USA. Many of these studies outlined the results of specific regional or state interventions. However, similarities in how and where youth acquire cigarettes indicate that some findings may be applicable to the UK. Furthermore, English survey data similarly highlights the need to create comprehensive interventions. Only one of the studies reviewed was conducted in the UK.

## 1 Background

Smoking among youth is of concern due to the health risks associated with tobacco use. A focus on the prevention of the uptake of cigarette smoking in children and youth is of particular importance as the majority of smokers initiate smoking or become habitual smokers prior to the age of 18 (Jason et al., 1999, Secretary of the State of Health, 1998, Ash 2007). In addition, those who began to smoke at a young age are less likely to give up than those who start smoking later in life (BMA, 2007, Secretary of the State of Health, 1998).

In England, the prevalence of regular smoking among young people aged 11 to 15 is 9% (ONS, 2007). Regular smokers consist of those who usually smoke at least one cigarette a week. Scottish data show comparable trends. There are several patterns and differences between sub-groups of youth. For example, there are significant differences between and among young males and females. Girls between the ages of 11 and 15 (10%) are more likely to be regular smokers than boys (7%). Furthermore, regular smoking increases with age. In England, 20% of 15 year olds are regular smokers compared to only 1% of 11 year olds (ONS, 2007). Regular girl smoking exceeds that of regular boy smoking (3% of boys and 7% of girls aged 13, rising to 16% and 24% aged 15). Overall, after controlling for variables, girls are more than two and a half times more likely to be regular smokers than boys, and the odds of being a regular smoker also increases with age (ONS, 2007).

Differences in the prevalence of smoking are not only affected by sex and gender, but also reflect diversity and inequality. Smoking uptake is often more likely to be situated among particular populations. Risk factors associated with youth smoking include low socioeconomic status, being female, mental illness, low parental education and living in a single parent household (BMA, 2007). There is also evidence that youth smoking rates are highest among those from low income backgrounds. Furthermore, the inequalities gap appears to be widening among boys. Among the most affluent boys, smoking rates declined between 2002 and 2004. However, smoking rates among the least affluent boys, and girls in all income categories remained the same (BMA, 2007).

Children and youth in care are particularly vulnerable to smoking uptake. In 2003, 32% of children aged 11-17 in England and Wales who were passing through the care system were current smokers. Seven out of ten (69%) youth in residential care and one in five youth in foster care (22%) were also current smokers (BMA, 2007).

### 1.1 Health Impacts

Cigarette use among youth is a major health concern in the United Kingdom. Despite the fact that youth smoking rates have declined over the past two decades, in 2005 regular smoking still occurs in children and young people. This is of particular concern since cigarette use is associated with a variety of short and long term health concerns. In the short-term, young smokers are more likely to develop respiratory illness and face co-morbidity issues (young smokers are more likely to use alcohol or drugs and are more often absent from school than non-smokers) (BMA, 2007). Furthermore, in comparison to non-smokers, children who smoke are two to six times more susceptible to coughs, wheeziness and shortness of breath.

In the long term, children who become regular smokers and persist in smoking into adulthood are more likely to develop cancer (such as in the lung, mouth, throat, esophagus, pancreas, kidney, liver, and cervix), cardiovascular disease (BMA, 2007, (Secretary of the State for Health, 1998), and heart disease (Ash, 2007). As a result it is essential to try to prevent cigarette use in children and youth.

## 1.2 Smoke-free Regulations

Cigarette smoking interventions aimed at youth operate within a broader context of comprehensive tobacco policies and legislation. In 1999, following the publication of the landmark White Paper *Smoking Kills* (Department of Health 1999), the health and economic effects of smoking were given greater priority in the political agenda in England. *Smoking Kills* laid out a comprehensive plan for reducing the prevalence of smoking in the UK, and entailed measures such as a ban on tobacco advertising, increases in the price of tobacco, the creation of NHS smoking cessation services and strategies to reduce smoking in work and public places (McNeill et al. 2005).

In relation to youth, specific targets were laid out in order to reduce smoking rates in England. As outlined in *Smoking Kills* (Department of Health 1999), the government aims to reduce the prevalence among 11-15 year olds to 9% by 2010. The government also intends to reduce smoking rates among adults to 21% by 2010. Some important mechanisms for achieving these targets are mass media interventions and access interventions aimed at youth.

## 1.3 Mass Media Interventions

Mass media interventions have increasingly been used to deliver preventive health messages and are particularly appropriate for reaching youth. Mass media interventions also have the ability to reach large segments of the population, especially those who have trouble accessing health related programmes and have lower levels of education (Lantz et al. 2000).

Children and youth are exposed to large numbers of mass media messages. This results largely from their access to multiple media mechanisms and other technologies. For example, 67% of children aged 5-16 in the UK have mobile phones, 25% of children have access to the internet in their bedrooms, almost all 5-16 year olds have access to multi-channel TV, while eight in ten have their own TV and seven in ten have their own DVD player (Childwise, 2007). It is important to note that access to these technologies allows children and youth to be exposed to both pro and anti tobacco messages. Furthermore, mass media have the potential to modify knowledge and attitudes among youth by influencing perceptions of what is acceptable and by shaping social norms (Sowden, Arblaster 1998).

Changing knowledge, attitudes and beliefs is a key component to preventing the uptake of smoking in children and youth. Evidence from English survey data indicates that awareness of the harms of smoking can impact the knowledge, attitudes and beliefs of young people. For example, many youth are familiar with the negative effects of smoking; 98% of young people think that smoking causes lung cancer, 97% think that smoking makes clothes to smell bad, 97% think that smoking harms unborn babies, 96% think that smoking harms non-smokers and 94% think that smoking causes heart disease. These findings have remained relatively consistent since 1990 (ONS, 2007). However, younger pupils were more likely than older pupils to think that smoking is not really harmful, except for those who smoke a lot (ONS, 2007).

Importantly, youth with more negative opinions about smoking are less likely to smoke (ONS, 2007). For example, 88% of youth aged 11 to 13 who smoked in the last seven days believed that smoking would harm an unborn baby, compared with 97% of those who had not smoked. Furthermore, 32% of those who had smoked in the past seven days thought that smoking is not dangerous and only affects those who smoke a lot, compared to 19% of those who did not smoke (ONS, 2007). As a result, it is essential to increase the awareness and exposure of mass media interventions to prevent the uptake of smoking by changing knowledge, attitudes and beliefs.

In addition to knowledge regarding the health risks of smoking, a variety of other factors influence young people's knowledge, attitudes and beliefs. For example, young people's attitudes are often influenced by family and friends and the wider cultural and social environment (including TV and mass media) (Scottish Executive, 2006). These factors are highly interactive and play a key role in influencing perceptions about smoking, knowledge about smoking, access to tobacco products and reasons for valuing or rejecting smoking (Scottish Executive, 2006).

Within this review, mass media interventions have been defined as programmes or campaigns aimed at reaching large numbers of people via television, internet, radio, newspapers, bill boards, posters leaflets, booklets and new media. New media includes media such as podcasts, text messaging, bebo, facebook, and social networking websites. Although there has been a lack of published information regarding new media techniques, these efforts are advantageous due to their low cost and adolescents' general receptivity to new technologies (Lantz et al. 2000).

#### **1.4 Point of Sale Interventions**

Within this review, point of sale measures included efforts to educate merchants and the general public about the minimum age law, proof of age schemes, regulation and law enforcement (including encouraging members of the community to help enforce the law). Restricting children and young people's access to cigarettes and tobacco has been a key component of tobacco legislation aimed at preventing the uptake of smoking. In October 2007 it became illegal to sell tobacco to youth under the age of 18 across the UK (BMA, 2007).

Research indicates that preventing youth access to tobacco may produce significant reductions in the rate of tobacco sales. Interventions that provide merchant education, increase community involvement and hold merchants accountable have been effective in reducing sales to minors (Levy, Friend 2000). However, poor compliance with laws has been documented (Stead, Lancaster 2000). Additionally, young people often receive their cigarettes from other sources. Youth often cite a variety of social sources such as family, friends or strangers who provide access to cigarettes. Youth may also be able to buy cigarettes singly (although this is illegal irrespective of age) or in packs of ten which make cigarettes more affordable. Furthermore, despite the fact that illegal sales to youth continue very few merchants have been prosecuted by the law or given any fines (BMA, 2007). Youth can also access cigarettes through the internet, vending machines, and contraband sources. As a result, while enforcement of youth access laws can lead to reductions in the sale of tobacco, it is not clear whether this actually translates to reduced tobacco consumption due to a variety of access issues (Lantz et al. 2000).

## 2 Methodology

### 2.1 Literature Search

The Information Collaborating Centre conducted the literature searches for this rapid review in July, 2007, with input from NICE and the British Columbia Centre of Excellence for Women's Health (BCCEWH). The literature searches covered published studies in the following standard databases: ASSIA, BNI, CDSR, CENTRAL, CINAHL, Current Contents, DARE, EMBASE, HMIC, HSTAT, MEDLINE, National Research Register, PAIS, PsycINFO, SIGLE, Social Policy and Practice, Sociological Abstracts, and TRIP. The database searches produced a total of 7365 references once duplicates were removed. The search team also examined 4 websites for relevant reports. The website searches produced 49 additional reports. A full description of the search terms and processes that were used is presented in Appendix A. Studies published in languages other than English and studies conducted in developing countries were not included in the review.

### 2.2 Selection of Studies for Inclusion

Once the literature searches were complete, the project team at the BCCEWH selected relevant studies using the procedure outlined in section 4.1 of the *Public Health Guidance Methods Manual*. The titles that emerged from the literature searches were initially scanned by one reviewer who removed studies that were clearly irrelevant to the research questions or outcomes of interest. Abstracts were obtained for the remaining papers. These abstracts were scrutinised in relation to the research questions by two reviewers and those that did not directly deal with the research questions or outcomes were eliminated. Once this sifting process was complete, paper copies of the selected studies and reviews were acquired for assessment.

#### 2.2.1 Population of Interest

In order to be included in this review, studies had to examine the impact of interventions on children and young people under the age of 18.

#### 2.2.2 Interventions of Interest

This review is international in scope. It includes: (a) mass media interventions that are designed to prevent the uptake of smoking by children and young people (including new media, such as podcasts, text messaging, bebo, facebook, and social networking websites and tobacco industry marketing tactics) and (b) interventions that are designed to prevent the illegal sale of tobacco to children and young people. The following types of interventions were not included in the review: family, education, and social interventions; school-based interventions; and counselling or self-help interventions which did not involve the use of mass media communications.

#### 2.2.3 Outcomes of Interest

The primary outcomes of interest for children and young people were:

1. Smoking rates among young people.
2. Children and young people's self-report of how they obtain their cigarettes.
3. Self-reported smoking behaviour including changes in consumption following an intervention and objective measures of smoking.

The secondary outcomes of interest for children and young people were:

1. Children and young people's knowledge about, and attitudes towards, smoking (including intention to smoke).



2. Children and young people's decision-making and refusal skills.

The primary outcome of interest for professionals responsible for preventing illegal sales was:

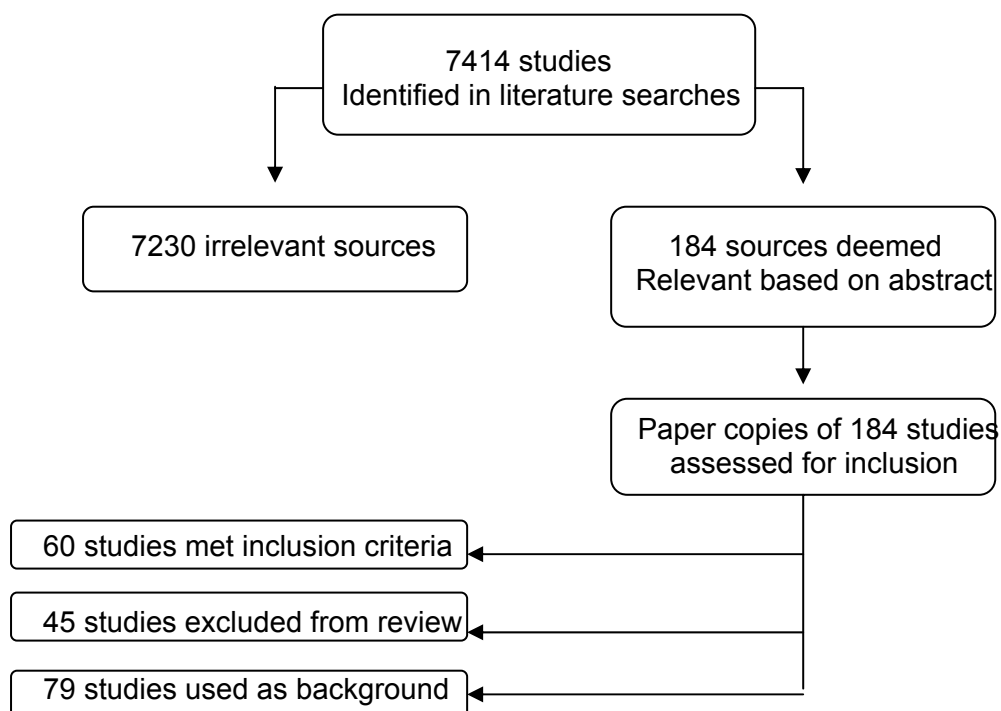
1. Number of sales to minors.

The secondary outcomes of interest for professionals responsible for preventing illegal sales were:

1. Number of warnings and cautions issued.
2. Number of spot checks.
3. Number of local authorities using children in test purchasing exercises.
4. Number of criminal proceedings and successful prosecutions.

Following the elimination of 7230 irrelevant records based on title alone (studies were eliminated that were clearly not relevant and/or did not address the research questions or outcomes of interest); the two reviewers assessed abstracts of 184 records for possible inclusion. Full copies of these studies were obtained and were independently assessed for inclusion by two reviewers. Of these studies, 60 (40 mass media, 20 access restriction) met the inclusion criteria for this rapid review, 79 studies were incorporated as background and 45 studies were excluded from the review (see figure 1). Studies that did not directly relate to the review, describe an intervention, or address the research questions or outcomes of interest were excluded. Additionally, individual studies reviewed by the Cochrane Reviews were not included or extracted in this review. The Cochrane Reviews have been used as a key source of evidence rather than attempting to summarise all of the individual studies identified in the literature search on this topic (this also prevented reporting studies more than once). It is also important to note that studies identified by the Cochrane reviews were based on different eligibility criteria and outcomes of interest. A list of excluded studies (n=45) with reasons for exclusion is presented in Appendix B.

**Figure 1. The evidence**



### 2.3 Quality Appraisal

All of the studies that met the inclusion criteria were rated by two independent reviewers in order to determine the strength of the evidence. Once the research design of each study was determined (using the NICE algorithm), studies were assessed for their methodological rigour and quality based on the critical appraisal checklists provided in Appendix B of the *Public Health Guidance Methods Manual* (see table 1) (Appraisal checklists examine a variety of factors specific to each study design including reliability, validity, confounders, randomisation, concealment, missing data, and eligibility. For more information regarding appraisal checklists please refer to the *Public Health Guidance Methods Manual*). Each study was categorised by study type and graded using a code ‘++’, ‘+’ or ‘-’, based on the extent to which the potential sources of bias had been minimised. Those studies (n=5) that received discrepant ratings from the two reviewers were resolved by consulting a third reviewer.

There is currently no methodological checklist for cross-sectional studies in the *Public Health Guidance Methods Manual*. In order to assess the quality of these studies, modifications to existing NICE checklists were recommended and a cross-sectional checklist based on the cohort study checklist in the manual was created (see Appendix C).

**Table 1. Type and quality of evidence**

<b>Type and quality of evidence</b>	
Randomised Control Trial (RCT)	
Meta Analyses	
Systematic Reviews	
Case Control Studies	
Cohort Studies	
Controlled Before and After (CBA) Studies	
Interrupted Time Series (ITS) Studies	
Qualitative Studies	
Cross Sectional Studies	
<b>Grading the evidence</b>	
++	<b>All or most of the quality criteria have been fulfilled</b> Where they have been fulfilled the conclusions of the study or review are thought <i>very unlikely</i> to alter
+	<b>Some of the criteria have been fulfilled</b> Where they have been fulfilled the conclusions of the study or review are thought <i>unlikely</i> to alter
-	<b>Few or no criteria fulfilled</b> The conclusions of the study are thought <i>likely or very likely</i> to alter

### 2.4 Key Informant Interviews

A key component of this review was consultation with experts in the area of new media, youth media, advertising, marketing and tobacco use. Due to a lack of published literature in this area, it was necessary to consult with selected key informants to strengthen the report. The key informant interview aimed to record participants' experience in the area of mass media, youth

and/or smoking prevention. Key informants were asked to draw on their own research experience, or their awareness of the literature and recent developments. It was recognised that key informant comments do not represent the views of their organisation or employer. The direction in which the field was heading and relevant resources was also discussed.

To determine who would be contacted as a key informant the BCCEWH team along with Linda Bauld and Amanda Amos (collaborators) developed a list of individuals from diverse fields with expertise in the area of mass media, smoking prevention and youth. The initial list of key informants included marketing experts, academics, tobacco control advocates (including those working in key voluntary sector organisations such as ASH and CR-UK) and those working on specific media campaigns.

Once the final list of potential key informants was identified (through conversation and networking among the BCCEWH review team), email invitations were sent out highlighting the purpose of the project and the reasoning behind conducting the interviews. In total 18 participants were contacted and 10 agreed to participate. Reasons for not participating included not having enough time or not feeling that they could directly answer the research questions. Once participants agreed, an interview date and time was scheduled. Participants were also sent the interview guide to review prior to the interview so that they were aware of the questions and so that they could prepare any relevant resources. The interview guide (Appendix D) asked for verbal consent to be audio taped, identified and to be re-contacted. Interviews lasted approximately 30 minutes to one hour. Verbal consent was also obtained to create a summary of the points they raised in response to each research question and to include points from this summary (but not direct quotes) in the report. Tapes of the interviewed were reviewed and notes were taken summarising the key points. The final list of the key informants is provided in Appendix E.

## 2.5 Synthesis

Evidence tables were developed for each graded study. Each article was also allocated a study type based on its research design. In most cases the reviewers were easily able to agree on study type but in some cases there was disagreement. In these instances the reviewers referred to the *Public Health Guidance Methods Manual* and to the algorithm for classifying studies within the manual. While evidence tables were being completed for the included studies, the research team discussed the themes that were emerging from the literature and which research questions each study applied to. For the most part, there was a reasonable fit between the research questions and identified studies. Finally, evidence statements were developed in the final stages of the review once findings for each research question could be summarised. Whenever possible, common themes were identified from each research question and summarised into an evidence statement. Attention was focused on evidence that was directly applicable to the UK. Overall, due to heterogeneity of design among the studies, a narrative synthesis was conducted.

### 2.5.1 Summary of Findings

There are two key questions that are the focus of this rapid review:

1. Which mass media interventions are effective in preventing children and young people from becoming smokers?

2. Which interventions are effective in reducing the illegal sale of tobacco to children and young people?

For each of these key questions, there are 9 sub-questions that are addressed:

- i. When appropriate interventions can be compared, which are most effective?
- ii. Are the interventions delaying rather than preventing the onset of smoking?
- iii. How does the way that the intervention is delivered influence effectiveness?
- iv. Does effectiveness depend on the status of the person (e.g., peer, parent or teacher) delivering it?
- v. Does the site/setting influence effectiveness?
- vi. Does the intensity of the intervention influence effectiveness or duration of effect?
- vii. How does effectiveness vary according to the age, sex, socio-economic status or ethnicity of the target audience?
- viii. What are the facilitators and barriers to implementation?
- ix. How would differences between the comparators used in published studies and the prevailing situation in England impact on the analysis of effectiveness?

### **3 Summary of Findings: Which mass media interventions are effective in preventing children and young people from becoming smokers**

There is evidence that mass media campaigns can prevent the uptake of smoking and also influence knowledge, attitudes and intentions of children and young people. Factors that have been shown to influence effectiveness in terms of attitudes, perceptions, beliefs and intentions include message source, message content, message format, message framing, duration, target audience, demographics of the audience, and the site/setting of the campaign. Factors that have been shown to influence effectiveness in terms of smoking behaviour (i.e. smoking in the past 30 days, decreased initiation of smoking, quitting, number of cigarettes smoked) include message content, target audience, duration of the mass media campaign, demographics of the audience, the number of anti-tobacco message sources and the TRUTH campaign. Overall, the factors outlined above work best when combined with broader tobacco control initiatives produced by tobacco control bodies. Furthermore, campaigns are most effective when they are long in duration and greater in intensity of exposure.

#### **3.1 When appropriate interventions can be compared, which are most effective?**

Four studies examined the source or sponsor of various mass media interventions. These studies examined how messages delivered by tobacco control, tobacco industry, and pharmaceutical companies were received by youth. For example, Henriksen and colleagues (2006) (cluster RCT, ++) analysed whether adolescents' exposure to youth smoking prevention ads sponsored by tobacco companies promoted intentions to smoke, curiosity about smoking, and positive attitudes toward the tobacco industry in a randomised control trial. The researchers suggest that the adolescents rated the tobacco companies' (Philip Morris and Lorillard) ads less favourably than the other youth smoking prevention ads (i.e. participants rated these ads as less convincing and less helpful in keeping friends from smoking and starting smoking). They confirmed that the tobacco companies' ads (Philip Morris, mean 2.48; 95% CI 2.42, 2.54; Lorillard, mean 2.50; 95% CI 2.44, 2.56) were perceived to be less effective than "truth" ads (mean 2.80; 95% CI 2.75, 2.85)  $p < 0.001$ . Nevertheless, the researchers found that adolescents' intention to smoke did not differ as a function of ad exposure. Exposure to these ads did, however engender more favourable attitudes towards tobacco companies. The mean scores for 'sympathy for cigarette companies' were significantly increased in adolescents exposed to Philip Morris (mean 2.26; 95%CI 2.14, 2.38) and Lorillard (mean 2.27; 95% CI 2.16, 2.39) ads compared to the other experimental groups ( $p = 0.006$ ). The researchers concluded that industry sponsored anti-smoking ads do more to promote the corporate image than to prevent youth smoking.

A cross sectional study by Wakefield and colleagues (2006) (++) examined exposure in the US to tobacco company youth-targeted and parent targeted smoking prevention advertising and youths' intentions, beliefs and behaviours. Findings revealed that there was little relation between exposure to tobacco company-sponsored, youth-targeted advertising and youth smoking outcomes (recall of ads or smoking beliefs and behaviors). However, each additional ad viewed was associated with a 3% stronger intention to smoke in the future (OR=1.03, CI=1.01, 1.05). Among youth in grades 10 and 12, during the 4 months leading up to survey administration, each additional viewing of a tobacco company parent-targeted advertisement was,

on average, associated with lower perceived harm of smoking (odds ratio [OR]=0.93; confidence interval [CI] = 0.88, 0.98), stronger approval of smoking (OR = 1.11; CI = 1.03,1.20), stronger intentions to smoke in the future (OR= 1.12; CI = 1.04,1.21), and greater likelihood of having smoked in the past 30 days (OR = 1.12; CI = 1.04,1.19). Overall, the authors conclude that exposure to tobacco company youth-targeted smoking prevention advertising generally had no beneficial outcomes for youth. Exposure to tobacco company parent-targeted advertising may have harmful effects on youth.

One cross sectional study (+) (Farrelly et al. 2002) compared how the American Legacy Foundation's "Truth" campaign and Philips Morris' "Think. Don't Smoke" campaign have influenced the attitudes, beliefs, and intentions of young people regarding tobacco. The authors concluded that exposure to the Truth ads resulted in an increase in anti-tobacco attitudes and beliefs that ranged from 6.6% to 26.4% for 'not looking cool' and 'efforts to eliminate smoking', respectively. In contrast, young people were more likely to be open to the idea of smoking when exposed to the Philip Morris advertisements.

In a cross-sectional study (+), Wakefield and colleagues (2005) analysed emotional reactions to anti-smoking advertising (e.g., fear, sadness, and anger). Anti-smoking television advertisements that have been on the air in the United States with a wide range of different themes, sponsors and target groups were used to examine these questions. Based on structural equation modeling, tobacco-industry ads (SD = -0.057(0.042), *ns*) and pharmaceutical company ads (SD=0.315(0.051),  $p<0.05$ ) were rated as less cognitively engaging than were ads created by tobacco-control programs. Ads produced by the tobacco industry and the pharmaceutical industry also were rated as having significantly less negative emotional appeal than were ads produced by tobacco control programmes (SD=-0.43 (0.093),  $p<0.05$  and -0.51(0.095),  $p<0.05$ , respectively). Teenagers perceived tobacco industry ads as less interesting than tobacco control ads (SD=-0.34(0.060),  $p<0.05$ ). The study found that youth responded to ads made by tobacco companies differently (i.e. emotionally, cognitively) than they did to ads made by tobacco-control agencies.

**Evidence Statement No. 1***Strength and applicability of evidence*

Evidence from one cluster RCT (++)<sup>1</sup> suggests that adolescents perceive tobacco industry sponsored advertisements less favourably and as less effective (i.e. participants rated these ads as less convincing and less helpful in keeping friends from smoking and starting smoking) in reducing smoking (specifically, fewer people taking up smoking based on the following outcome measures: intention to smoke, curiosity of tobacco use, tobacco industry sympathy) than other smoking prevention advertisements, but also express greater sympathy with the tobacco companies after viewing their advertisements. Yet, neither the industry sponsored nor other prevention ads changed adolescent's intention to smoke.

One cross-sectional (+)<sup>2</sup> study found that an American tobacco control campaign did increase anti-tobacco attitudes and beliefs, while an industry-sponsored campaign encouraged an interest in smoking. Similarly, one cross sectional study (++)<sup>3</sup> found that exposure to tobacco company youth-targeted smoking prevention advertising generally had no beneficial outcomes (measured by young people's attitudes, beliefs and intentions regarding the tobacco industry, and tobacco use ten months into the "truth" campaign) for youth. Exposure to tobacco company parent-targeted advertising was associated with lower perceived harm of smoking, stronger approval of smoking, stronger intentions to smoke in the future and greater likelihood of having smoked in the past 30 days. Another (+)<sup>4</sup> US-based cross sectional study found that tobacco industry ads were less interesting, less cognitively engaging, and held less negative emotional appeal for teenagers than ads created by tobacco control programs.

1. Henriksen et al., 2006
2. Farrelly et al., 2002
3. Wakefield et al., 2006
4. Wakefield et al., 2005

Applicability: All of the studies took place outside of the UK. It is unclear whether their findings are applicable to the UK given the fact that the mass media interventions are specific to the USA and the demographics of participants do not reflect that of the UK.

*Key Informants*

Key informants were asked questions relating to the main issues addressed by the review. Key Informants did not discuss or compare which interventions were more effective.

**3.2 Are the interventions delaying rather than preventing the onset of smoking?**

No studies identified by the literature specifically addressed whether mass media interventions are delaying rather than preventing the onset of smoking among children and youth.

**Evidence Statement No. 2***Strength and applicability of evidence*

No studies included in the review examined whether mass media interventions are delaying rather than preventing smoking uptake in children and youth.

### *Key Informants*

When asked whether interventions were delaying rather than preventing the uptake of smoking, all of the key informants agreed that there is a lack of information regarding this question. For example, three key informants (Karen Gutierrez, tobacco control; Cameron Norman, University of Toronto; & Ruth Bosworth, QUIT) mentioned that campaigns in general can delay uptake in youth, but will not necessarily prevent youth from smoking when they become young adults. From a Canadian context, Cameron Norman (University of Toronto) stated that youth often start smoking around the age of 17 or 18, or during university. He argued that young people are not provided with the resources required to stay smoke-free as they transition into adulthood. According to Pierre Sequier (HELP), another challenge for developing interventions which delay smoking among youth is that discussing the long-term health effects of smoking often does not appeal to youth.

Ruth Bosworth (QUIT) noted that in the case of Quitline and QUIT webfilms, for example, she did not know if the effects of such mass media interventions would be sustainable. Ruth argued that long term prevention hinges on the ongoing repetition and reinforcement of mass media interventions (which Quit try to do in partnership with their community and schools work, for example) alongside wider tobacco control measures. This point was picked up by Martin Raymond (Cloudline) who argued that sustained TV campaigns can have a positive cumulative effect. Thus while ads are generally aimed at young adolescents when they are starting to think about smoking, they can have a delayed impact. For example, older teenagers in some of the Health Scotland/HEBS evaluations talked about how they thought about ads from previous years when in particular situations.

When asked about whether campaigns are preventing uptake in children and young people Brian Crook (The Bridge) felt that there is no absolute evidence from HEBS/Health Scotland. HEBS and Health Scotland have not addressed this question in tracking/evaluation research, rather they have tended to focus on attitude change and shifts in social norms. However, Brian personally believes that new media campaigns can, and have, had an impact on behaviour in addition to impacting attitudes. Furthermore, Brian Crook highlighted that in order to determine if campaigns are preventing smoking uptake long term studies (probably over more than 10 years following a cohort) are needed. This requires long term commitment from funding organisations which is difficult to get.

In terms of specific interventions, three key informants (Amanda Sandford, ASH; Gerard Hastings, University of Stirling; & Karen Gutierrez, tobacco control) agreed that the "Truth" campaign in the US delayed and prevented the onset of smoking among young people. In general, Hein de Vries (Maastricht University) believed that prevention interventions, whether mass media or other, have the potential to both delay and prevent the uptake of smoking by youth.

Finally, none of the key informants were aware of any evidence published in the UK that specifically describes interventions that are effective in delaying the onset of smoking. However, Gerard Hastings (University of Stirling) and Lawrence Moore (University of Cardiff) indicated that some school-based campaigns may have a role to play in postponing the uptake of smoking. Amanda Sandford (ASH) pointed out that delaying the onset of smoking is important because the long-term health damage from smoking is much more severe the younger the uptake occurs; someone who begins smoking at 12-13 years of age is much more likely to develop



a smoking related disease in later life than someone who starts smoking at 16 or 17 years of age, for example.

### **3.3 How does the way that the intervention is delivered influence effectiveness?**

Effectiveness of mass media interventions is determined by message delivery. For example, many articles discussed the ways in which message content, mode of delivery, target audience, message framing and message elements impact the attitudes, beliefs, intentions and behaviours of children and youth. Each will now be explored.

#### *Message Content*

Message content in anti-smoking ads can take many forms. To date, some of the anti-smoking ads aimed at youth have focused on health effects, cosmetic effects, tobacco marketing practices, the impact of second hand smoke, and characterising the tobacco industry as murderers. The effectiveness of these message types will now be explored.

In a review (+) examining the effects of anti-smoking advertising on teenagers, Wakefield and colleagues (2003) suggest that although there is some research to suggest that graphic health effects ads, social normative ads, and tobacco industry manipulation ads can positively influence teenagers (increased knowledge about the harms of smoking, lower intentions to smoke and lower perceived prevalence of smoking), the findings are far from consistent. Similarly, in an international review (+) by Schar and colleagues (2005), the authors note that campaigns vary in effectiveness depending on the message content used. The purpose of this review was to assess the elements of paid media campaigns that appear to have been most effective in changing youth attitudes about smoking, encouraging youth to commit to not smoking and, in some cases, reducing tobacco use. The authors state that ads that portray health effects, social disapproval, or refusal skills can be effective with youth. However, the results of one social approval/refusal skills ad campaign included in the review was found to be ineffective when implemented on a large scale, but effective when tested in community trials. Although ads that portray information on the deceptive practices of the tobacco industry have been found to be effective, the authors note that audiences need to be exposed to the message over time in order for them to be effective. Mass media campaigns that communicate information on the harms of second hand smoke, cosmetic effects, athletic performance and individual choice do not appear to be effective.

In a RCT (++) Pechmann and co-workers (2003) examined the effectiveness of 7 types of anti-smoking ads representing health, counter-industry, and industry approaches. Themes used in the ads included disease and death, endangering others, cosmetics, smokers' negative life circumstances, refusal skills role models, marketing tactics, and selling death. Severity of health risk was scored from 0 – 9, with higher scores indicating a perception of higher severity. Among all subjects, several message themes enhanced health risk severity perceptions compared to controls: disease and death (mean 7.68,  $p < 0.05$ ), endangering others (mean 7.91,  $p < 0.01$ ), and selling death (mean 8.15,  $p < 0.01$ ). Intentions not to smoke were bolstered by endangering others (mean 4.22,  $p < 0.01$ ), smokers' negative life circumstances (mean 4.13,  $p < 0.01$ ) and refusal skills role models (4.03,  $p < 0.05$ ). None of the message themes affected self-efficacy at refusing cigarette offers, self-efficacy at resisting tobacco marketing, or health risk vulnerability.

In another RCT (++), Pechmann and Reibling (2006) examined the effectiveness of 8 types of antismoking ads representing health, counter-industry, and industry approaches (disease, dying parent, environmental tobacco smoke, selling disease and death, counter-industry activism, marketing tactics, acceptance of non-smokers and cosmetic effects). Using a 5-point scale, researchers found that ads focusing on youth victims suffering from serious tobacco-related disease elicited enhanced anti-industry motivation (mean 3.74; SE 0.09,  $p < 0.05$ ), and reduced intent to smoke (mean 1.34; SE 0.07,  $p < 0.01$ ), when compared to controls. However, the researchers found that counter-industry and industry ads did not significantly lower smoking intention. Accordingly, the authors suggest that sponsors of campaigns should copy test ads before they air and should use ads that depict tobacco-related disease and suffering, rather than restricting their campaigns to counter-industry ads.

In a cross-sectional study (+) (Niederdeppe, Farrelly, Haviland 2004) evaluating the effectiveness of the Truth campaign, researchers suggest that the Truth campaign was successful in reducing teen smoking. The Florida Truth campaign consisted of "truth" messages that described the tobacco industry's purposeful attempts to market a harmful product to young people and its denial of cigarettes' addictive and deadly effects. In Florida, teens were less likely than their national counterparts to have smoked in the last 30 days (6.6% vs. 14%), to have ever tried smoking (24.3% vs. 33.5%) ( $p < 0.01$ ) or to indicate any possibility of smoking in the future (13.8% vs. 24.3%). Teens in Florida also had higher unaided levels of Truth campaign awareness than their national counterparts (44.8% vs. 20.1%).

Devlin and co-workers (2007) conducted a UK based qualitative study (++) using focus groups that explored young people's responses to different types of message appeal. The three appeals compared were "fear appeals," "social norms," and "industry manipulation." In terms of fear appeals ads, interviewees did not see themselves as targets of these messages and, as a consequence, did not feel it necessary to respond to these threats. In terms of social norms ads, many interviewees said that the advertisements spoke to them at their level and were realistic in terms of social pressure without preaching or telling them what to do. Actors that were slightly older than the target audience also were more effective. In terms of industry manipulation ads, many respondents found them attractive, slick, and sophisticated; however many rejected the idea that the industry might be manipulating their own behaviour by encouraging them to smoke or to smoke certain brands. Using a qualitative research design, the authors concluded that no single anti-smoking message appeal is likely to have universal appeal and that young people's responses to message appeals are mediated by the values they attach to smoking.

A RCT (+) conducted by Smith and Stutts (2006) found that youth who were exposed to anti-smoking ads were less likely to smoke ( $p < 0.01$ ), had lower intentions to start smoking ( $p < 0.01$ ), and had greater intentions to quit ( $p < 0.01$ ). However, the results of the study suggest that message types differ in their effect. For example, although cosmetic ads and health ads were similarly effective in making youth less likely to smoke (-0.2 for cosmetic and health), health ads were significantly more effective in lowering intentions to start smoking (0.04 for cosmetic vs. -0.38 for health) and increasing intentions to quit (-0.03 for cosmetic vs. -0.40 for health).

Finally, in a review (+) of the impact of state and local mass-media campaigns on smoking prevalence and cigarette consumption, Friend and co-workers (2002) suggest that the mixed findings that have emerged from research on youth oriented interventions is attributable to a number of factors. For example, the authors suggest that the impact of message type is dependent upon the population targeted and the

degree of support for tobacco control activities within the jurisdiction. In addition, the authors suggest that mass media programmes often overlook the impact of message content and progression to established smoking among distinct demographic groups. Applicability: Most of the studies were conducted in the US. It is not clear if these findings are directly applicable to the UK since the mass media campaigns under investigation are specific to the US. Furthermore, demographics or participants are different from those in the UK. International review data may be broadly applicable to the UK the review is international in scope.

### **Evidence Statement No. 3**

#### *Strength and applicability of evidence*

How an intervention is delivered does influence the attitudes, perceptions and behaviours of young people. Evidence from two (+)<sup>1,2</sup> reviews found that message content does influence the effectiveness of an intervention, though the impact is not consistent, and also depends on the duration of delivery. One (++)<sup>3</sup> RCT study found that message content could change perceptions of health risk severity and intentions not to smoke, though none of the message themes resulted in: increased self-efficacy for refusing cigarette offers or resisting tobacco marketing, or improved health risk vulnerability. Another (++)<sup>4</sup> RCT study found that using tobacco related disease messaging was more effective for increasing anti-tobacco attitudes, whereas anti-industry ads did not decrease young peoples intention to smoke.

Evidence from a US cross-sectional (+)<sup>5</sup> study found that 'truth' messages were effective in decreasing and preventing smoking in youth (Florida teens were less likely to smoke in the past 30 days, to have ever tried smoking, or to indicate that they could not rule out the possibility of smoking in the future).

A UK-based (++)<sup>6</sup> qualitative study found that social norms messages were more effective than fear messages at encouraging more committed smokers to consider their smoking behaviours and reinforcing awareness of the dangers of smoking in less committed smokers. Industry manipulation ads were aesthetically appealing but ineffective for preventing the uptake of smoking. Similarly, one (+)<sup>7</sup> review and one RCT (+)<sup>8</sup> study conclude that anti-smoking ads can improve smoking prevention and cessation in youth (by making youth less likely to smoke, have lower intentions to smoke, and have greater intentions to quit smoking), but the specific outcomes of any message type depends on the context and the values that the audience associates with smoking.

1. Wakefield et al., 2003
2. Schar et al., 2005
3. Pechmann et al., 2003
4. Pechmann et al., 2006
5. Niederdeppe et al., 2004
6. Devlin et al., 2007
7. Friend et al., 2002
8. Smith et al., 2006

Applicability: Most of the studies were conducted in the US. It is not clear if these findings are directly applicable to the UK since the mass media campaigns under investigation are specific to the US. Furthermore, demographics of participants are different from those in the UK. International review data may be broadly applicable to the UK since the review is international in scope.

### *Mode of Delivery*

In a cross-sectional study (-) Seghers and Foland (1998) evaluated two anti-tobacco campaigns. The purpose of each campaign was to increase the exposure (airing and placement) of existing anti-tobacco advertisements. Using anti-tobacco media materials obtained from the Office on Smoking and Health Resource Center, each campaign aimed to prevent and/or stop children from using tobacco. Both campaigns used focus groups to determine which media materials were most relevant to youth. The researchers found that 88% of participants recalled the anti-smoking ads. TV ads were recalled most often. When asked about their intent to quit smoking within the next 30 days, the proportion of participants (who recalled being exposed to the anti-smoking advertisement) aged 13 years and younger who responded "yes" increased from 18% to 50%; the proportion of participants (who recalled being exposed to the anti-smoking advertisement) aged 14 years and older who responded "yes" increased from 37% to 56%. Notably, although there was a dramatic increase in the *intent* to quit smoking among participants, there was little change in the young people's actual attempts to quit smoking.

A US based qualitative study (+) conducted by Parlove et al. (2004) used focus groups to examine the acceptability of using the web as a mode of delivery for smoking interventions for youth. Using focus groups, this study identified key design elements for inclusion in web-based interventions for youth. The researchers found that elements such as interactivity, expert-trusted guidance and graphics within text are appealing to youth. In addition, the study revealed a general distrust of information obtained from the internet among youth; youth preferred to receive information from their teachers and parents. Nevertheless, youth reported that they believe that the internet provides a wealth of knowledge, is easy to use, and is easy to access. They also indicated that they believe that it is beneficial to have interactive tools to carry them through the negative effects of smoking. Good websites, in their minds, have visual and content appeal. ASH's website was perceived to be boring and in need of colour, music, noise, and graphics. The researchers concluded that web-based interventions (a non-traditional approach) may compliment smoking prevention programs delivered through schools and the community.

A cross sectional study (+) conducted by Dunn et al. (2004) evaluated a state-wide anti-tobacco industry youth organising movement. Branding index scores (based on: hearing about an anti-industry movement event, hearing about the anti-industry movement Document Truck at a school in their area, receiving promotional gear, attending an anti-industry movement booth) were significantly related to taking action to get involved ( $p \leq .001$ ) and the spreading of an anti-industry message ( $p \leq .001$ ). Furthermore, messaging index scores (based on: hearing other kids talk about the tobacco industry, participating in an anti-industry presentation, awareness of an informational campaign, walking through an anti-industry Truck exhibit) were significantly related to attitudinal constructs (the tobacco industry targets kids, the tobacco industry should be blamed for kids smoking, empathy for the tobacco industry, teens have been influenced, and actions by kids can be effective; each  $p \leq .001$ ), taking action to get involved ( $p \leq .001$ ), and the spreading of an anti-industry message ( $p \leq .01$ ). The relationships between messaging or branding activity scores and susceptibility were not statistically significant (p-value not stated). The researchers concluded that organising efforts by youth, together with intensive countermarketing media campaigns, can be effective in preventing smoking among young people by creating negative attitudes towards the tobacco industry.

#### Evidence Statement No. 4

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##### *Strength and applicability of evidence*

Studies included in the review analysed the effectiveness of a variety of mass-media formats. One cross-sectional (-)<sup>1</sup> study found that television ads were recalled more often than other formats and that viewing the ads increased intention to quit, though did not affect actual quit attempts. Evidence from one qualitative (+)<sup>2</sup> study indicates that youth deemed websites as effective for obtaining information on smoking if they incorporated: interactivity, expert-trusted guidance, and appealing graphics. One (+)<sup>3</sup> cross-sectional study reveals that youth organising movements and intensive counter-marketing media campaigns can be effective in preventing the uptake of smoking and fostering anti-tobacco industry beliefs among youth.

1. Seghers et al., 1998
2. Parlove et al., 2004
3. Dunn et al., 2004

Applicability: All three studies were conducted in the USA. Given that the findings are in response to specific USA interventions it is not clear if findings are applicable to the UK.

##### *Target Audience*

Three papers examined the impact of adult-focused (or general population) mass media campaigns on youth. In their review (+) of state and local mass-media campaigns, Friend and co-workers (2002) found that well-funded and well-implemented state-level mass media campaigns targeted at the general population were successful in reducing smoking rates among adults as well as youth when they were implemented in conjunction with comprehensive tobacco control programmes.

White and colleagues (2003) examined adolescents' awareness of and response to an adult-focused anti-smoking advertising campaign in their (+) cross sectional study. The researchers found that 54% (95% CI, 48%-60%) of non-smokers and 16% (95% CI, 9%-23%) of smokers thought that the adult focused campaign was relevant to them ( $p < 0.01$ ). Only three quarters of smokers and non-smokers thought that the campaign made smoking less desirable. Slightly more smokers (16%) than non-smokers (14%) thought that the campaign had made smoking more appealing to some teenagers; however the difference was not significant (difference 2%; 95% CI, -6%-10%). The campaign generated quitting among current established smokers with 18% (95% CI, 14% to 22%) saying they had tried to give up smoking, 27% (95% CI, 23% to 31%) saying they had cut down the number of cigarettes they smoked and 26% (95% CI, 22% to 30%) saying they had thought about quitting.

In another review (+), Schar and colleagues (2005) suggest that there is no clear consensus regarding the relative effectiveness of ad campaigns that are directed at youth and ad campaigns that are directed at both adults and youth. The authors indicate that both types of campaigns have been successful in changing the attitudes and behaviours of youth. On the basis of their review, however, the authors stress the importance of avoiding mass media ads that employ a "preachy" tone; they argue that ads of this type may lead youth to rebel against the message.

### Evidence Statement No. 5

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#### *Strength and applicability of evidence*

Evidence from one cross-sectional (+)<sup>1</sup> study and one (+)<sup>2</sup> review suggest that adult-focused or general population campaigns are successful for reducing smoking (cutting down the number of cigarettes smoked, increasing numbers of youth attempting to quit, making it easier to stay a non-smoker) in youth. Yet, one (+)<sup>3</sup> review contends that both youth and general-oriented messaging can be effective in developing awareness, and changing attitudes and behaviours associated with tobacco use, as long as messages are not deemed patronising by youth.

1. White et al., 2003
2. Friend et al., 2002
3. Schar et al., 2005

Applicability: No studies were conducted in the UK. It is not clear if findings are directly relevant to the UK context.

#### *Message Framing*

In a RCT (+), Kim (2006) explored how message framing can influence the effectiveness of advertisements aimed at preventing smoking amongst young people in Korea. Using a 7-point scale (1=definite no; 7 = definite yes), Kim found lower intentions to smoke, lower perceived pharmacological benefits of smoking, and lower perceived psychological benefits of smoking among youth when the regulatory goal and antismoking message frame were congruent. For intention to smoke, the promotion-primed condition participants exposed to the promotion-framed message (mean 2.34, SD 1.35) had lower intentions to smoke than those exposed to a prevention-framed message (mean 3.04, SD 1.34) and those in the control group (mean 3.32, SD 1.85)  $t(171) = -2.73, p = 0.007$ . In the prevention-primed condition participants exposed to the prevention-framed message (mean 2.48, SD 1.30) had lower intentions to smoke than those exposed to a promotion framed message (mean 3.34, SD 1.35) and those in the control group (3.32, SD 1.85)  $t(171) = -2.91, p = 0.004$ . On the basis of these findings, Kim concluded that anti-smoking messages for youth with a promotion focus must emphasize promotion-related merits of refraining from smoking. Similarly, anti-smoking messages with a prevention focus should emphasize prevention-related merits of refraining from smoking.

### Evidence Statement No. 6

#### *Strength and applicability of evidence*

One RCT (+) found that message framing impacts the effectiveness of an intervention by lowering intentions to smoke, lowering the perceived pharmacological benefits of smoking, and lowering the perceived psychological benefits of smoking. In particular, it is important that the message framing is consistent with the desired outcome.

1. Kim, 2006

Applicability: Given the broad cultural differences between South Korea and the UK the findings of this study are likely less relevant to the UK.

#### *Message Elements*

In their review (+) Schar et al. (2005) note that it is difficult to disentangle the contributions of distinct message elements such as content, format, and tone. The authors argue that, in order for an ad to be effective, attention needs to be given to

all elements and ad execution (e.g., ad creation and implementation). There are a number of studies that have examined distinct elements of mass media messages.

A cross sectional study (+) conducted by Niederdeppe (2005) examined the relations among perceived message sensation value (PMSV)<sup>1</sup>, message processing, and drug use among youth. Message features that were examined included intense imagery (graphic, arousing), acting out (youth engaged in actions that correspond with ad), a second-half punch (shocking surprising end), a fast-pace, sound saturation (background noise), and loud, fast music. Niederdeppe concluded that there were no specific associations between message features and processing among teens. Among older teens, the number of unrelated cuts (OR=1.03,  $p<0.001$ ) and the use of suspenseful features (OR= 1.21,  $p<0.001$ ) increased the odds of processing. Unrelated cuts, intense images, and second half punch were significantly associated with increased message processing in younger teens (OR= 1.11,  $p<0.01$ ). The effect was considerably larger among older teens (OR= 1.25 $p<0.001$ ).

A RCT study (+) conducted by Grandpre et al. (2003) analysed the impact of pro- and anti-smoking messages on a variety of outcomes, including participants' intended behaviours, evaluations of message sources, and seeking of disconfirming information. There was a significant main effect for message type ( $F[1, 613]=21.079$ ,  $p<0.001$ ). Based on a 5-point Likert scale (1= very good; 5=very bad), implicit messages resulted in a more positive source evaluation (mean = 2.66) than explicit messages (mean = 3.06). Students had a more negative evaluation of the source of pro-smoking messages than the source of anti-smoking messages, regardless of type of message.

A RCT (++) by Pechmann and colleagues (2002) examined whether cigarette ads function as primes by portraying positive smoker stereotypes (thus favourably biasing adolescents' perceptions of peers who smoke). A "prime" is an activating stimulus event that causes a pre-activation of social constructs or knowledge structures. For example, a positive smoker stereotype that is activated by cigarette ads may cause youth to seek out favourable evidence about smokers. Findings revealed that subjects who saw peers smoking in advertisements revealed that cigarette ads (vs. control ads not consisting of anti-smoking or cigarette ads) weakened their negative stereotypic beliefs ( $t(710)=3.62$ ,  $p<0.01$ ) and increased their intention to smoke ( $t(710)=2.00$ ,  $p<0.01$ ). When subjects saw peers who were not smoking, cigarette (vs. control) ads had no impact on stereotypic beliefs or intentions ( $p's>0.40$ ). The anti-smoking (vs. control) ads did not significantly impact on beliefs or intentions, regardless of whether shown with smokers or nonsmoker's ( $p's>0.10$ ).

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<sup>1</sup> Perceived message sensation value refers to the relationship between specific audio, visual, or format features and outcomes related to persuasion. PMSV was measured by asking participants questions regarding their engagement with the message.

## Evidence Statement No. 7

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### *Strength and applicability of evidence*

One (+)<sup>1</sup> review contends that effective messaging should attend to all message elements. Specifically, evidence from one cross-sectional (+)<sup>2</sup> study suggests that message processing in older teens improves when messages incorporate unrelated cuts and use suspenseful images. One cross-sectional study (+)<sup>3</sup> found sources were evaluated more positively for implicit rather than explicit messages, and for anti-smoking rather than pro-smoking messages. Evidence from a RCT (++)<sup>4</sup> study reveals that youth exposure to cigarette ads depicting youth can decrease negative stereotypic beliefs about smoking and increase intention to smoke.

1. Schar et al., 2005
2. Niederdeppe, 2005
3. Grandpre et al., 2003
4. Pechmann et al., 2002

**Applicability:** The demographics of study participants and the mass media interventions under investigation are specific to the USA. It is not clear if findings are applicable to the UK.

### *Key Informants*

The key informants were asked to talk about how interventions are delivered and how this influences effectiveness. They talked at length about elements of mass media interventions including mode or delivery, youth involvement, social norms, behaviour change, communication principles, media content and usability. Finally, key informants discussed their overall impressions of the effectiveness of mass media interventions.

### *Mode of Delivery*

Each key informant drew on their own experience of relevant research to describe what particular forms of mass media are potentially most effective in prevention. Many key informants discussed the effectiveness of various modes of delivery. For example, TV campaigns and the internet were regarded as effective means for communicating with youth and preventing smoking. Informants also discussed: the potential of new media formats, the importance of collaborating with youth when developing mass media interventions, and the effectiveness of interventions which use a social norms or stages of behaviour change approach.

Pierre Sequier (HELP) felt that television was a valuable medium for smoking prevention campaigns. However, he recognised that some European countries have centralised TV which may limit the number of channels available for anti-tobacco messaging. This can create challenges since it is essential to place prevention messages during key airtimes, or on specific stations viewed by the target audience. Furthermore, Pierre Sequier (HELP) mentioned that investing in mixed format messaging can be an effective way to reach youth. For example, the HELP campaign has linked their television and website messages, to reach and engage young people who regularly use computers.

Brian Crook (The Bridge) felt that TV is still an important mode of delivery. He commented that an advertising industry trade body (IPA) recently reviewed 750 papers on the effectiveness of ads and found that TV still the most effective medium for all ages. He also argued that TV ads play a crucial role in communicating key messages and evidence indicates that young people still talk about TV. Brian Crook went on to say that new media could be used to reinforce TV campaigns by evoking richer and deeper responses. He also commented that if you only focus on new media there is a danger that the message would get lost among other messages.



Martin Raymond (Cloudline) also thought that TV, particularly in the 1990s, had been the most cost-effective way of achieving attitudinal and behavioural shifts. Through careful placement of ads (eg the BRIT awards, Hollyoaks) large young audiences can be reached, and cheaply. However, he thought that this may no longer be the case as over the past few years there has been a large decrease in youth TV audiences as they have turned to new more interactive media. While TV ads may still have a role to play (eg they are good at engaging emotions, being entertaining, have a quick turn around, can help build/define a trustworthy brand and its values), he thinks that the digital media can have considerable potential as a medium for reaching young people. In particular, digital media enables inter-active communication (this has been a weakness in previous mass media campaigns). Digital media also allows messages to be tailored to individual circumstances. However, Martin Raymond (Cloudline) thought that realising this potential will be challenging, and has yet to see any agencies, including commercial, achieve this. A key challenge is that one is 'intruding' into young people's own territory. It is not clear whether messages would be welcomed or accepted in the social networking environment in the same way as ads on TV. It will also be difficult to measure this due to the fast changing and fragmented nature of new media.

Likewise, Amanda Sandford (ASH) thought that the research evidence to date suggested that the most effective media intervention was TV advertising. However, Amanda felt that campaigns intended for the general population have been more successful than campaigns aimed specifically at young people (HEA's 'smoking stinks' campaign of the 1990s, for example, and HEBS (Scotland's) young people's campaign). Amanda also argued that smoking uptake may be linked to many young people's aspirations or ideas about adulthood. She pointed out that because there is evidence that young people do respond to pro-smoking messages aimed at adults, they may also respond to anti-smoking messages aimed at the general population--rather than just those directed at youth. Martin Raymond (Cloudline), while arguing for the importance of youth focused campaigns, also recognised that adult campaigns can impact on young people. In particular he cited the example of some of the early ads for the Scottish Smokeline, a telephone quitline aimed at adults, which generated more calls from teenagers than adults.

Amanda Sandford (ASH) also commented on the power of new media in shaping youth smoking behaviours. She used the example of a recent example of a clip on YouTube that has been discussed on the international tobacco control network, Globalink. This clip depicts a smoker breathing onto a white handkerchief and leaving tar residue. This type of image clearly depicting one of the by-products of smoking could be a powerful tool for prevention and may be seen by youth who use YouTube. Amanda pointed out, however, that if these and other forms of new media are to be used effectively to convey prevention messages then one of the challenges is how they will be evaluated and how these evaluations will be commissioned and funded.

Similarly, Karen Gutierrez (tobacco control) and Ruth Bosworth (QUIT) believed the internet may be becoming a more effective tool than TV for reaching youth, but neither had any data to support this theory. Ruth described how webfilms developed by Quit to convey prevention and cessation messages have been well received by youth and were clearly linked to increased calls to their young person's helpline. She also stressed the importance of using youth ambassadors to create effective interventions. For example, Quit's previous webfilm, 'Black Magic' was directed by John Williams who is in his mid 20s. He has recently developed another Quit webfilm, specifically targeted at boys (called 'cigarettes, brought to you by mugs'),

while another young, female director had developed one for girls (called 'sexiness in a stick').

#### *Collaborating with Youth*

Gerard Hastings (University of Stirling) also discussed the importance of collaborating with youth when developing mass media interventions. He thought the Florida "Truth" campaign was one of the best examples of a well-evaluated mass media intervention to prevent smoking uptake. The campaign was successful because it was youth endorsed, lead and driven. Young people acted as youth ambassadors for the anti-smoking promotion. Extensive preparation also contributed to the campaign's success. The programme developers engaged youth leaders and undertook a comprehensive educational campaign on the activities and influence of the tobacco industry, through a series of weekend workshops. Both Karen Gutierrez (tobacco control) and Ruth Bosworth (QUIT) also argued that interventions must ideally be tested and refined with young people. When developing the recent webfilms, for example, Quit tested ideas and the formats with focus groups of boys and girls, via their school-based work. This is an approach they've also used for past media interventions.

#### *Social Norms*

Gerard Hastings (University of Stirling) believed that campaigns employing a social norms approach could be useful for denormalising smoking among youth. Good social norms campaigns reach beyond mass media by: educating youth about the actual activities of the tobacco industry, condemning/revealing the activities of the tobacco industry, restricting point of sales, and dealing with packaging/branding issues.

Martin Raymond (Cloudline) also highlighted the importance of media campaigns in denormalising smoking among young people. Indeed this was the main aim of the HEBS, and subsequently Health Scotland's, approach in their long running young people's 'Think About It' campaign. This campaign, which included several anti-smoking ads, aimed to stimulate and support cultural shifts by challenging young people through reflecting their views back to them and encouraging debate. He explained that as with much general marketing communication these ads were not expected to have immediate impacts on young people's behaviour but rather to engage them in reflecting on their attitudes and behaviours, and to support face-to-face prevention work in other settings such as schools. Thus campaign evaluations, which included tracking studies and focus groups, focused on 'softer' measures of change such as awareness levels, discussions about the ads with friends, attitudinal shifts. He also echoed other key informant's view that to be effective you need to understand young people's lives and concerns, and to build up a dialogue with them over several years.

#### *Stage of Behavior Change*

Both Hein de Vries (Maastricht University) and Karen Gutierrez (tobacco control) talked about stages of behavior change and how interventions can facilitate this process. Karen stated that interventions need to: build awareness, deliver the main point, build knowledge, change attitudes and beliefs, and change behaviours. Similarly, Hein de Vries argued that comprehensive interventions should be effective when they address three phases, including: pre-motivational (when the child or youth does not know they are at risk), awareness, and post-motivational (when effective goals can be set to change behaviour). Hein de Vries (argued that the vast majority of mass media campaigns focus too much on the pre-motivational stage (making young people aware of risks), without addressing the other stages. Therefore, a

multifaceted approach (delivered at a number of different points in time and using a variety of tools/interventions) is required which targets all three phases.

### *Communication Principles*

Three key informants expressed the need to use basic principles of communication when developing mass media campaigns for youth. Both Gerard Hastings (University of Stirling), Martin Raymond (Cloudline), and Karen Gutierrez (tobacco control) stated that campaigns that patronise or involve experts 'telling' young people what to do can be ineffective. Gerard and Martin emphasised that campaigns should be developed with young people, for young people, and rigorously tested before being released. Indeed this was the approach used by HEBS where focus groups and tracking surveys were used iteratively to evaluate and develop ads, so that each built on the previous one. This view was endorsed by a number of other interviewees, in particular the need to involve young people in designing campaign messages and material.

### *Media Content*

In addition to principles of communication, Ruth Bosworth (QUIT) discussed the importance of mass media content. For example, she highlighted that campaigns should be fun and not 'insult' the intelligence of young people. She pointed out that for some young people smoking is all about 'chasing adulthood.' As a result, prevention messages should be 'pitched' at a slightly older age group than the target audience. For example, Ruth explained that Quit often tries to design adverts that feature or 'speak to' 16-18 year olds with the expectation that these adverts will also appeal to younger youth.

### *Usability*

In terms of usability, Cameron Norman (University of Toronto) suggested that internet based campaigns need to be simple, user friendly and be tailored to the needs and abilities of youth. He also commented that mass media campaigns should be evaluated and modified if possible following evaluation feedback. The importance of adequately evaluating mass media interventions was something that was emphasised by a number of the key informants.

### *Effectiveness of Mass Media Interventions*

Overall, when asked whether mass media interventions have been effective in preventing children and young people from smoking, the comments from the key informants were mixed. Although six key informants thought that mass media interventions are effective, it was recognised that mass media interventions alone may not prevent children and young people from smoking. For example, Gerard Hastings (University of Stirling), Martin Raymond (Cloudline), Lawrence Moore (University of Cardiff) and Hein de Vries (Maastricht University) highlighted that mass media interventions are most effective when developed as part of a wider tobacco control programme. For example, mass media is best used as part of an integrated intervention that has a number of different components (i.e. school and community interventions) using a variety of different forms of information and service provision. This was echoed by Cameron Norman (University of Toronto) who stated that successful interventions use multiple "mixed" media and are tailored to meet the needs of youth (i.e. using the internet, video games, celebrity endorsements, text messaging and chat rooms). Ruth Bosworth (QUIT) also argued that "mixed" media was helpful. At Quit, she found TV and video advertising and most recently webfilms, a successful way to communicate their message. Amanda Sandford (ASH) highlighted that there is some evidence that mass media campaigns (TV, radio and print) are effective in encouraging quit attempts and/or cessation (she cited

the recent Cochrane Review). However, she pointed out that the evidence on *preventing* uptake is more limited.

Hein de Vries (Maastricht University) and Martin Raymond (Cloudline) both highlighted that there is a lack of evidence indicating that mass media interventions alone lead to behaviour change. Martin Raymond (Cloudline) argued that this would not only be difficult to measure, but behavioural change is often not an appropriate or realistic goal for youth campaigns. Hein de Vries stated that where there is evidence, the effect sizes are very small. In particular, there is little or no evidence that mass media interventions are effective in changing self-efficacy or goal-setting behaviour amongst young people. Hein) argued that both are needed if a decision not to smoke (or to quit) is made. Furthermore, he felt that very few studies have focused on the 'intention-behaviour' gap. Hein noted that it is often easier to ask young people what they think of a campaign rather than measure its effect on behaviour. Finally, he argued that published evidence about the effectiveness of mass media interventions alone suffers from the 'attribution' problem. In other words, it is difficult to demonstrate that the campaign was what changed people's behaviour, especially when many studies have not use a controlled design.

#### **3.4 Does effectiveness depend on the status of the person (e.g., peer, parent or teacher) delivering it?**

There was a lack of information on whether the effectiveness of mass media interventions depends on the status of the person delivering the message or campaign. However two studies highlighted the impact of social support in reinforcing anti-smoking messages. For example, a study (cross sectional, +) by Reinert et al. ( 2004) examined whether the number of sources of anti-tobacco information (e.g., family members, sporting events, community events, advertisements, internet sources) influenced youth use of tobacco and attitudes towards smoking. The researchers found that young people who were exposed to anti-tobacco messages through a variety of sources were less likely to use tobacco than those who were exposed to anti-tobacco messages through only a few sources. A small but statistically significant positive correlation emerged between the number of anti-tobacco sources that youth encountered and the likelihood that they would reject a cigarette offered to them by a best friend ( $r = .13$ ,  $p < .001$ ;  $n=1,151$ ).

Similarly, a review (+) by Wakefield et al. ( 2003) suggests that social interactions through family, peer, and cultural contexts can reinforce or neutralise the effects of anti-smoking ads. For example, teenage girls who discuss media campaigns with another individual, particularly a peer, are more likely to display positive behavioral outcomes (reduction in the odds smoking) than those who do not.

Finally, as highlighted by the key informants below, youth count on trusted sources for their information on tobacco. Several studies highlight that youth do not perceive the tobacco industry as a trusted source of anti-tobacco information. For example, a cross-sectional study (+) by Hersey et al. ( 2003) examined the impact of state-funded counter-industry media campaigns on beliefs about tobacco industry practices and smoking status. Teens from counter industry states were significantly more likely to agree that cigarette companies lie (83.2% vs. 72.3%,  $OR= 1.57$ ,  $p<0.05$ ), that cigarette companies try to get young people to smoke (83.6% vs. 71.2%,  $OR=1.58$ ,  $p<0.05$ ) and that cigarette companies deny that cigarettes are addictive (72.2% vs. 53.8%,  $OR=2.22$ ,  $p<0.05$ ). Similarly, Farrelly et al. ( 2002) conducted a cross-sectional study (+) in which they contrasted the impact of the Truth campaign and Philips Morris' "Think. Don't Smoke" campaign on youths'

attitudes toward tobacco and intentions to smoke. Exposure to the Truth campaign resulted in greater agreement with statements such as “cigarette companies lie” (OR = 1.28 per additional advertisement;  $p < .001$ ).

### **Evidence Statement No. 8**

#### *Strength and applicability of evidence*

No studies specifically discussed how the status of a person delivering an intervention can have an impact on its effectiveness. Yet, one cross sectional study (+)<sup>1</sup> and one (+)<sup>2</sup> review reveal that youth who are exposed to a large variety of anti-tobacco sources are more likely to refuse tobacco, and that social interactions can support anti-tobacco messaging. Evidence from two cross sectional studies (+)<sup>3, 4</sup> indicates that the tobacco industry is not a trusted source of information among young people.

1. Reinert et al., 2004
2. Wakefield et al., 2003
3. Hersey et al., 2003
4. Farrelly et al., 2002

**Applicability:** It is not clear if findings are directly applicable to the UK since they are USA based. However, international review data may be broadly applicable.

#### *Key Informants*

No key informants directly discussed the status of the person delivering mass media interventions. Comments were made about the status of the person delivering other prevention interventions (i.e. school-based programmes) but these were not specific to mass media. However, Lawrence Moore (University of Cardiff), Martin Raymond (Cloudline), and Ruth Bosworth (QUIT) highlighted the importance of trust when delivering effective mass media interventions. For example, they stated that in order to reach an adolescent audience, it is important that ‘trusted sources’ provide prevention messages. Lawrence Moore (University of Cardiff), Martin Raymond (Cloudline), and Ruth Bosworth (QUIT) highlighted that these sources can include media but inevitably include peers (particularly peer leaders). Martin Raymond described how HEBS, while a governmental agency, through the tone of voice adopted by the Think About it campaign had become an authoritative and trustworthy ‘brand’ with Scottish young people. However this approach takes time, investment and an appropriate social marketing approach which may be difficult to achieve if different agencies are involved or the style and content of ads keep changing. Overall, constantly refreshing ads was seen as an important and very expensive aspect of targeting mass media young people.

Additional ‘trusted’ sources of information include: friends, ‘popular’ young people, small groups of close adults (perhaps including parents and teachers), electronic sources of media (in particular the web and text messaging), and social networking tools such as Bebo (these sites bring together people, or allow people to communicate who seem to ‘think the same way’ which builds trust). Lawrence Moore (University of Cardiff) also suggested that there is some evidence that ‘viral marketing’ techniques (which identify key young people, market a product to them and then use them as ‘carriers’ of that message) or “informal transfer” may be successful in preventing the uptake of smoking in children and youth.

### 3.5 Does the site/setting influence effectiveness?

A cross-sectional study (-) by Zollinger and coworkers (2006) examined the awareness and impact of anti-tobacco media messages among rural, suburban and urban youth in Indiana. In contrast to rural youth, suburban youth were more likely to recall media messages about the dangerous health effects of tobacco use (OR = 1.94; p=0.05) and have their personal choice to use tobacco influenced by these messages (OR = 1.85; p=0.05). Moreover, in contrast to rural youth, suburban youth (OR = 2.02; p=0.05) and urban youth (OR = 1.47; p=0.05) were more likely to report that media ads made them think about the dangers of tobacco use.

In an Australian non-randomised controlled trial (+), Edwards and co-workers (2004) evaluated the effect of an anti-smoking advertisement on young women's (age 12-17) perceptions of smoking in movies and their intentions to smoke. The advertisement was aired during a movie. The control group was not exposed to the advertisement, while the intervention group was. Both the control and intervention groups consisted of smokers and non-smokers. The researchers found that among non-smokers, 48.2% of the intervention subjects disapproved of smoking in movies, whereas 25.2% of the control subjects disapproved of smoking in movies (chi-squared=83.11, df, 3, p<0.0001). There was no overall significant effect of the intervention on intention to smoke (chi-squared=3.26, df=2, p<0.196). There was a significant relation between intention to smoke and smoking status (chi-squared=643.09, df=2, p<0.0001), with a lower percentage of smokers than non-smokers indicating they would be unlikely to smoke in 12 months. The study provides some support that showing an anti-smoking ad before a movie lowers intention to smoke in the future among smokers (but not non-smokers).

#### Evidence Statement No. 9

##### *Strength and applicability of evidence*

Site/setting does influence effectiveness of an intervention. Evidence from one (-)<sup>1</sup> cross-sectional study suggests that suburban, urban and rural youth interpret and respond to anti-tobacco messages differently. Suburban and urban youth are more likely to report increased perceptions of the danger of tobacco use. One Australian based (+)<sup>2</sup> non-RCT study found that including anti-smoking advertisements during a movie increased disapproval of smoking in movies. Youth who were smokers did not demonstrate any change in approval, but did express a desire to quit after the intervention.

1. Zollinger et al., 2006
2. Edwards et al., 2004

Applicability: Given the differences in demographics of study participants and the interventions under investigation it is not clear if findings are directly applicable to the UK.

##### *Key Informants*

Martin Raymond (Cloudline) was the only key informant to comment specifically on whether the site or setting of mass media interventions influenced effectiveness. In particular he highlighted differences between urban and rural Scottish young people's peer and social networks. Rural young people, for example, have less social options and thus friendship groups while important can become 'claustrophobic'. This, he believes can impact on their smoking behaviours and how they engage with prevention campaigns. However, he felt it was difficult to say in absolute terms

whether urban or rural young people have more or less peer group pressure. In addition, several key informants talked about the importance of mode of delivery, tailoring and message location.

In relation to the internet, Cameron Norman (University of Toronto) highlighted the importance of choosing or creating websites that are frequented by, or tailored specifically to youth. For example, Cameron Norman (University of Toronto) highlighted that government websites are not necessarily popular with youth, and thus, may not be good locations for anti-tobacco media messages. As a result, he suggested locating prevention messages on websites that are frequented by youth such as the "Much Music" website (a popular Canadian music TV station).

Hein de Vries (Maastricht University) and Ruth Bosworth (QUIT) felt it was important to consider where mass media messages are delivered. Hein commented that schools are a good setting for prevention efforts because large numbers of youth can be reached. However, it was recognised that delivering prevention messages in schools can be difficult since they often compete with other topics. Furthermore, some schools and/or teachers may not be keen to deliver prevention campaigns. Alternatively, schools can still be a good access point to get information home to parents and families. For example, accessing address details through schools enables researchers/agencies to send children a personal letter about a prevention campaign.

Finally, Hein de Vries (Maastricht University) stressed the importance of recognising that "site and setting" are context and country specific. For example, in some countries involving churches in prevention efforts is an appropriate location for message delivery. Meanwhile, sports and community organisations remain important locations for message delivery in other countries. As a result, it is important to be culturally and country appropriate when choosing which contexts and locations to deliver interventions.

### **3.6 Does the intensity of the intervention influence effectiveness or duration of effect?**

Several studies identified by the literature search examined the impact of exposure levels on the uptake of smoking. For example, in a Cochrane review (++) , Sowden and co-workers ( 1998) examined the effectiveness of mass media campaigns in preventing the uptake of smoking among young people. On the basis of their review, the authors suggest that mass media campaigns can prevent the uptake of smoking among young people; however, the evidence supporting the effectiveness of these campaigns is not strong. Furthermore, the authors maintain that the intensity and duration of a campaign are the most important factors influencing health-related behaviour. Two successful campaigns reviewed by Sowden et al. were of greater intensity and duration than other less successful campaigns; further, they analysed one review that found mass media campaigns which were more intense in reach, frequency and duration were most effective. Several studies have examined the results of exposure to mass media campaigns across time.

A cross-sectional study (++) conducted by Johnston et al. ( 2005) provides data on the extent of exposure (defined as the frequency of exposure to a various media within recent months, rated according to a 6-point answer scale) to anti-smoking media campaigns among youth between 1997-2001, an appraisal of youth reactions to ads, and an examination of how exposure levels and reactions vary by socio-demographic characteristics. The researchers found significant increases in exposure to anti-smoking ads across time. In addition, they found increases in rate

of recall with exposure and increases in the number of youth who reported that anti-smoking ads made them less likely to smoke. In 2001, 8<sup>th</sup> grade students were not only the most likely to say that the ads had had at least some impact (participant expressed that the media campaign would make them less likely to smoke cigarettes) (58.7%) but also showed the strongest increase over the 5 years of data collection (starting at 44.2% in 1997, and ending at 58.7% in 2001, an increase of 14.5 percentage points. In contrast, 2001 levels were 44.9% for 10<sup>th</sup> graders, (a 10.0 percentage point increase from 1997) and 38.3% for 12 grade students (a 9.2 percentage point increase from 1997).

Emery and co-workers ( 2005) (cross sectional, +) examined the impact of state-sponsored anti-tobacco media campaigns while controlling for other tobacco-related advertising and tobacco control policies. Mean exposure to at least one state-sponsored anti-tobacco advertisement in the past 4 months was associated with lower perceived rates of smoking among friends (OR = 0.72; 95% CI = 0.58-.88), greater perceived harm of smoking (OR = 1.25; 95% CI = 1.11-1.42), stronger intentions not to smoke in the future (OR = 1.43; 95% CI = 1.17-1.74), and lower odds of being a smoker (OR = 0.74; 95% CI = 0.63-0.88).

In a cross-sectional study, Murray and co-workers ( 1994) (++) evaluated a state-wide tobacco control program in Minnesota, which included: higher taxing, school-based programming, mass media campaigns and local community grants. They compared adolescent tobacco beliefs and behaviors in Minnesota and Wisconsin, where there was no similar comprehensive state-wide program between 1986-1990. The researchers found that the Minnesota initiative dramatically increased exposure to anti-smoking mass media messages but did not have a significant effect on smoking-related beliefs or smoking behaviour. Although the net decline in tobacco use in Minnesota did not significantly differ from the net decline in Wisconsin (F=1.17, df=4, 448; P=0.3238), the prevalence of smoking was lower in Minnesota than Wisconsin over the entire 5-year period of the study (12.6% vs. 16.1%; F=28.80; df=1, 438; P<0.0001). On the basis of their findings and the findings of other research, the authors argue that a drastic increase in exposure (based on an increase in reported frequency) to anti-tobacco mass media messages in the absence of school-based tobacco prevention measures may not be successful in reducing tobacco use among adolescents.

A cross-sectional study (+) conducted by Hersey et al. ( 2003) examined the impact of state-funded counter-industry media campaigns on beliefs about tobacco industry practices and smoking status. The researchers found that young people living in states with aggressive counter-industry media campaigns were more likely to have negative beliefs about tobacco industry practices. Teens from counter industry states were significantly more likely to agree that smoke from others peoples cigarettes can be harmful (96.2% vs. 92.9%, OR=2.00, p<0.05). Teens from counter industry states were also significantly more likely to agree that cigarette companies lie (83.2% vs. 72.3%, OR= 1.57, p<0.05), that cigarette companies try to get young people to smoke (83.6% vs. 71.2%, OR=1.58, p<0.05) and that cigarette companies deny that cigarettes are addictive (72.2% vs. 53.8%, OR=2.22, p<0.05). The researchers concluded that aggressive media campaigns using counter-industry messages may be successful in reducing smoking behaviour among youth by changing their beliefs about industry practices, but that more research is needed examining the relationship between industry attitudes and smoking status.

In another cross-sectional study (+), Hersey, Niederdeppe, and co-workers ( 2005) examined the impact of state-funded counter-industry media campaigns on youth (aged 12-17 years) cigarette smoking while controlling for the effects of price, secular



trends, tobacco control efforts, and the national Truth campaign. Between 1999-2002 rates of current and established smoking decreased significantly faster in states with established more newly funded counter-industry campaigns than in other states ( $p < 0.05$ ). Current smoking rates declined by 55% in established campaign states (from 12.3% to 5.5%) and by 47% in newer campaign states (from 15% to 7.9%). The rate of decrease in campaign states was roughly twice that of other states (52.6% vs. 24.9%); this difference was significant ( $p < 0.05$ ) after controlling for age, sex, race/ethnicity. Over time, perceptions about the tobacco industry showed an increasingly stronger relationship with smoking status in campaign states. Within campaign states, youth had more negative perceptions of the tobacco industry; in 2002 the odds of being a smoker was lower than 1999 (OR=0.76 vs. OR=0.86;  $p < 0.05$ ).

In a cohort study (+), Weiss and colleagues (2006) examined the longitudinal impact of self-reported exposure to pro- and anti-tobacco media on adolescents' susceptibility (measured as interest in smoking uptake) to smoking. The authors found that increased levels of pro tobacco media exposure at baseline was positively associated with susceptibility (OR 1.9 – 3.3,  $p < 0.01$ ), whereas increased levels of exposure to anti-tobacco media at baseline were associated with lower rates of smoking susceptibility (OR 0.74,  $p < 0.05$ ). Findings regarding the counter effects of anti-tobacco media exposure on pro-tobacco media exposure suggest that anti-tobacco media exposure does not mitigate the harmful effects of pro-tobacco media exposure.

Sly et al. (2002) conducted a cross-sectional study (++) in which they examined the cumulative effects of exposure to multiple anti-tobacco advertisements on smoking uptake over a 22-month period. Findings revealed that youth with low scores on the media effect index (measuring confirmed awareness, receptivity and cognitive or perceived influence) and those with high scores were 22% and 40.4%, respectively, were less likely to take up smoking than those not affected by the media campaign. The odds of remaining non smokers increased as the number of ads confirmed, the self reported influence of the campaigns major message theme and the level of anti-tobacco attitudes increased. The observed effects were greater in established smokers than non-smokers. The pattern of these relationships holds within cohorts of younger and older youth. Considering all variables simultaneously suggest that ad confirmation operates through its effects on the influence of the message theme and anti-tobacco industry manipulation. Overall, smoking initiation was lower for those scoring higher (more exposure) as opposed to lower (less exposure) on the ad effectiveness index.

In a cross-sectional study, Popham and coworkers (1994) (+) collected four waves of data in order to evaluate a media campaign targeted at youth (students in grade 4-12) and adults. The first wave of data was collected prior to the campaign; the latter three waves of data were collected after the campaign. The researchers found that, across the four waves, tobacco use decreased from 12.5% to 10.9% ( $p < 0.0025$ ); non-smokers' intention to start smoking decreased from 24.6% to 22.1% ( $p < 0.0025$ ); and negative attitudes towards smoking increased from 73 % to 75.2% ( $p < 0.0025$ ). Based on these findings, the researchers concluded that the media campaign had many positive effects on California students.

**Evidence Statement No. 10***Strength and applicability of evidence*

Evidence from one (++)<sup>1</sup> Cochrane review suggests that the duration of an intervention will have the greatest bearing on health behaviours. In support of this, evidence from four cross-sectional studies (two ++, and two +)<sup>2,3,4,5</sup> identified by the literature search reveals that increased exposure to anti-smoking ads over time results in a decrease in: youth smoking in the past 30 days (compared to those in markets with no exposure to state-sponsored anti-tobacco laws), intent to smoke, initiation of smoking, enhanced perception of risk, and negative attitudes about smoking.

Similarly, two cross-sectional (+)<sup>6,7</sup> US studies demonstrate that young people living in states with aggressive counter-industry media campaigns are more likely to have negative beliefs about tobacco industry practices, are less likely to smoke, and are more informed about the dangers of second-hand smoke. As well, one (+)<sup>8</sup> cohort study found that pro-tobacco media increased susceptibility to smoking, while anti-tobacco media decreased susceptibility. Conversely, one (++)<sup>9</sup> US-based cross-sectional study did not find a relationship between exposure to anti-smoking campaign and improved ideas about smoking or health behaviours. They argue that in order to be effective, exposure must be supported by other tobacco control initiatives.

1. Sowden et al., 1998
2. Johnston et al., 2005
3. Murray et al., 1994
4. Emery et al., 2005
5. Popham et al., 1994
6. Hersey et al., 2003
7. Hersey, Niderdeppe, et al., 2005
8. Weiss et al., 2006
9. Sly et al., 2002

Applicability: None of the studies were conducted in the UK. However, given the nature of exposure to mass media campaigns findings may be applicable to the UK.

*TRUTH Campaign*

A number of studies identified by the literature search examined Florida's TRUTH campaign. Given the unique and effective nature of this campaign (i.e. well funded, involved youth, focused on the deceptive practices of the tobacco industry) findings from this campaign will now be explored.

In a cross-sectional study (++)<sup>10</sup>, Farrelly and co-workers (2005) examined the impact of the Truth campaign on youth smoking rates. Data were collected from over 50,000 students in grades 8 (age 12/13), 10 (age 14/15), and 12 (age 16/17) using the Monitoring the Future Survey, 1997-2002. The authors found that the campaign accounted for a significant reduction in youth smoking. The post-Truth campaign annual declines were significantly greater than the pre-Truth campaign annual declines, both overall and by grade. Smoking rates decreased from 25.3% to 18.0% between 1999 and 2002, with the campaign accounting for approximately 22% of this decline (95% CI=8.2%, 35.6%). Eight-grade students showed the largest decline in smoking at 45%, whereas twelfth-grade students showed the smallest decline in smoking at 27%. Results of a logistic regression analysis for all grades

demonstrated a significant dose-response relationship between Truth campaign exposure and current smoking prevalence (OR = 0.78; 95% CI = 0.63-0.97;  $p < .05$ ). The odds ratio for the quadratic GRPs provides evidence of a diminished effect at higher levels of exposure (OR = 1.11; 95% CI = 1.00-1.25;  $p < .07$ ).

Farrelly et al. (2002) conducted a cross-sectional study (+) in which they contrasted the impact of the Truth campaign and Philip Morris' "Think. Don't Smoke" campaign on youths' attitudes toward tobacco and intentions to smoke. Their findings revealed a significant dose-response effect for the Truth campaign (OR = 1.2;  $p < .005$ ). Greater intensity of exposure resulted in greater agreement with statements such as "cigarette companies lie" (OR = 1.28 per additional advertisement;  $p < .001$ ). Greater intensity of exposure also increased youth interest in taking a stand against smoking ( $p < .01$ ). In contrast, a greater exposure to "Think. Don't Smoke" advertisements did not influence agreement with anti-smoking statements.

In a cross-sectional study (++), Sly et al. (2001) presented selected findings from their evaluation of a state counter-advertising anti-tobacco media campaign. Four cross-sectional phone surveys were used to track and monitor advertising and campaign awareness, confirmed awareness and receptivity among youth in Florida and a national sample of youth. The Florida baseline and one year surveys were contrasted to parallel national surveys in order to assess attitudinal change and smoking-related behavioural change attributed to the campaign. At baseline, there were no attitudinal differences and only minor behavioural differences between the treatment and comparison populations. Significant increases in ad specific awareness, confirmed, receptivity, and campaign awareness (40%) were reached by the 6<sup>th</sup> week. They continued to rise though the first year (70%). No attitude and only minor behaviour differences were noted between the treatment and comparison populations at baseline. Despite higher levels of awareness in Florida at baseline, the data suggest a campaign effect at 1 year Florida had higher levels of awareness (92% vs. 55%) and higher levels of confirmed awareness (89% vs. 30%). Furthermore, at 1 year, the declines in 'ever tried a cigarette', 'current user' and 'susceptibility' were greater in Florida (13% vs 4%, 8.9% vs -12%, 333% vs 1%, respectively), than nationally  $p < .05$ .

In a cross-sectional study (+), Hersey and colleagues (2005) examined how exposure to the Truth campaign influenced beliefs, attitudes, and smoking behaviour. Using telephone surveys conducted 9 months before and 15 months after the campaign launch, the researchers found that youth in markets with higher levels of campaign exposure had more negative beliefs about tobacco industry practices ( $\beta = -.177$ ), more negative attitudes towards the tobacco industry ( $\beta = .634$ ), lower receptivity to pro-tobacco advertising ( $\beta = .414$ ), and lower intent to smoke ( $\beta = .208$ ). These results indicate that higher levels of exposure are associated with lower scores on the smoking status continuum ( $\beta = .099$ ), a finding that is consistent with Truth effect.

## Evidence Statement No. 11

### *Strength and applicability of evidence*

Results from four cross-sectional studies (two ++, and two +)<sup>1,2,3,4</sup> indicate that the TRUTH campaign was successful in improving the prevention of youth smoking over time. Studies show that the campaign resulted in: decreased prevalence of smoking in youth, greater agreement with anti-smoking statements by youth, and stronger anti-tobacco attitudes and beliefs.

1. Farrelly et al., 2005 (++)
2. Sly et al., 2001 (++)
3. Farrelly et al., 2002 (+)
4. Hersey et al., 2005 (+)

Applicability: The TRUTH campaign is a specific USA anti-tobacco mass media campaign. Due to the nature of the campaign and the demographics of US young people, results are not directly relevant to the UK.

### *Key Informants*

Key informants did not comment in detail on whether the intensity of the intervention can influence the effectiveness or duration of effect.

The exceptions were Martin Raymond (Cloudline) and Hein de Vries (Maastricht University) who provided some comments on this issue. Both reported that in their experience intensity and duration can be important factors for success; campaigns or programmes must be sustained and not short lived. This may be particularly true for children and young people who may benefit from consistent and continued exposure to prevention efforts to counteract the sustained pro-tobacco messages they will be receiving from others and wider society.

In terms of duration, Hein de Vries mentioned the significance of follow-up to monitor effective interventions. Considering that some interventions can demonstrate a delayed prevention effect (i.e. in a school-based study differences between the control and intervention groups in Portugal were not apparent until 3 years after the initial intervention and they were then significant), Hein stressed the importance of adequate follow-up. Furthermore, if an intervention has a number of different phases, then delayed uptake may eventually lead to prevention which would be a positive outcome. As a result, follow up would successfully track those changes. Finally, Hein de Vries thought many mass media interventions (and health promotion interventions) were far too ambitious in their hopes for positive outcomes after relatively little input over a short period (for example, expecting 5 contact points during an intervention for young people to result in prevention). As a result, Hein argued that multi-faceted approaches over a longer period of time are needed to successfully prevent smoking in young people.

### **3.7 How does effectiveness vary according to the age, sex, socio-economic status or ethnicity of the target audience?**

#### *Sex/Gender*

The results of a RCT (+) conducted by Smith and Stutts (2006) suggest that ads portraying the health consequences of smoking and ads portraying the cosmetic consequences of smoking differ in their impact on males and females. Results from this study were based on mean changes in scores using a 5-point Likert scale. For males, health ads were found to have a greater impact on smoking behaviour (self-reported smoking status) (adjusted mean change: -0.18 for health vs. 0.04 for cosmetics) ( $p < 0.05$ ) and intentions to quit (adjusted mean change -0.92 for health vs. 0.03 for cosmetic) ( $p < .01$ ). For females, cosmetic ads were found to have a greater impact on smoking behaviour (adjusted mean change: -0.07 for cosmetic vs.

0.11 for health) ( $p < 0.05$ ) and intentions to quit (-0.10 for cosmetic vs. 0.05 for health) ( $p < .01$ ). Notably, for both males and females, health ads were found to be more effective in reducing intentions to start smoking (adjusted mean change- males: -0.58 for health vs. 0.05 for cosmetic,  $p < .01$ ; females: -0.19 for health vs. 0.02 for cosmetic,  $p < .01$ ). Finally, the treatment differences observed between genders were significant. Interaction tests for gender x treatment were  $p < .05$  for smoking behaviour and intention to start smoking, and  $p < .01$  for intention to quit.

In a cohort study (+) examining the longitudinal impact of self-reported exposure to pro- and anti-tobacco media messages on adolescents' susceptibility (expressed intention to start smoking) to smoking, Weiss et al. (2006) found that a higher proportion of males (47.9%) relative to females (41.5%) were susceptible to smoking by year 3 ( $p < 0.01$ ).

In a cross-sectional study (+), Shegog and colleagues (2005) evaluated the impact of a web-based tobacco prevention programme called "Headbutt" on intent to smoke among youth. The researchers discovered the Headbutt programme impacted smoking intentions, pro-smoking attitudes, self-efficacy expectations, and knowledge of negative consequences ( $p < 0.001$ ). Findings revealed that no gendered effects were found. Both males and females were equally likely to change intentions as a result of using the Headbutt programme ( $p = 0.893$ ).

In Zollinger et al.'s (2006) cross-sectional study (-) examining the awareness and impact of anti-tobacco media messages among rural, suburban and urban youth in Indiana, general awareness of the campaign was the same for both genders. However, the perceived impact of the anti-tobacco messages and specific media campaign messages was significantly higher for females (no  $p$ -value provided). Significantly more females than males recalled the anti-tobacco messages on TV (90.2% vs. 87.9%) and radio (68.1% vs. 58%).

A cross-sectional study (+) conducted in Norway by Hafstad et al. (1996) describes the results of a survey designed to measure the short-term effects of one of three consecutive mass media campaigns to prevent smoking among youth. This particular campaign targeted girls and, therefore, the aim of the study was to examine gender differences. The authors concluded that smokers had stronger affective reactions towards the campaign than non-smokers ( $p$ 's  $< .0001$ ) and girls reacted more strongly than boys. Moreover, among non-smokers, girls had a stronger positive behavioral reaction (having managed to quit smoking, deciding to quit smoking, or having considered to quit smoking) towards the campaign than boys ( $p = .003$ ). A positive affective reaction was the most important predictor of positive behavioural outcomes. Among smokers, having discussed the campaign with another individual was also a predictor of positive behavioural outcomes ( $p = .003$ ).

**Evidence Statement No. 12***Strength and applicability of evidence*

Several studies discuss sex and gender based differences in the effectiveness of media interventions. One RCT (+)<sup>1</sup> found that for girls, cosmetic ads had a greater impact on smoking behaviour (including how often girls smoke, how long they have been smoking for and the number of cigarettes smoked) and intentions to quit; while health ads had a greater impact on smoking behavior (including how often boys smoke, how long they have been smoking for and the number of cigarettes smoked) and intention to quit for boys. Health ads were also most useful for reducing girls and boy's intention to start smoking. Evidence from one (+)<sup>2</sup> cohort study found that over time, boys were more susceptible (expressed greater interest in smoking uptake) to smoking than girls. One (+)<sup>3</sup> cross-sectional study found no gender differences in the effectiveness of an anti-smoking campaign. A cross-sectional (-)<sup>4</sup> study found that while awareness was similar for girls and boys, girls had a greater recall of anti-tobacco messaging. In a (+)<sup>5</sup> cross-sectional study based in Norway, girls demonstrated a stronger behavioral response (reporting that the campaign had affected their beliefs or decisions concerning smoking) to an anti-smoking media campaign.

1. Smith et al., 2006
2. Weiss et al., 2006
3. Shegog et al., 2005
4. Zollinger et al., 2006
5. Hafstad et al., 1996

Applicability: None of these studies were conducted in the UK. It is not clear if the findings are directly relevant, as gender is culturally defined and prescribed.

*Age*

In a review (+) by Wakefield et al. (2003), the impact of anti-smoking ads on teenagers was examined. The findings of the review suggest that anti-smoking ads are more effective in preventing youth smoking in pre-adolescence or early adolescence than youth in late adolescence.

Schar et al.'s (2005) review (+) suggests that youth who are older are less responsive to typical tobacco counter-marketing messages. As a result, the authors argue that those who develop youth-focused campaigns should incorporate messages that appeal to a broad range of youth. Although there is evidence to suggest that age-targeted campaigns can improve effectiveness, the authors note that messages that appeal to all ages and risk categories of youth have been successful.

According to Farrelly and co-workers (2005) (cross sectional +) when exposed to the TRUTH campaign (1997-2002) grade eight students exhibited the largest declines (45%). The average annual percentage change was less from 1997-1999 (-3.4; 95%CI=-4.6, -2.1) compared to 2000-20002 (-9.0; 95% CI=-10.4-7.6). Meanwhile, grade 12 students showed the smallest decline (27%). From 1997-1999 the average annual percentage change was less (-1.8, 95% CI=-2.7,-1.0) than the average annual percentage change from 2000-2002 (-5.1, 95% CI= -6.1, -3.9).

In a cross-sectional study (+), Shegog and colleagues (2005) evaluated the impact of a web-based tobacco prevention programme called "Headbutt" on intent to smoke among youth. Findings revealed that age was significantly associated with change in intention, with older students showing greater change in behavioral intentions than younger students ( $p=0.036$ ).

Using a RCT (+), Smith and Stutts' (2006) found that mass media ads were effective in decreasing smoking behaviour (measured by asking youth how often they smoke, how long they have been smoking and how many cigarettes they smoke per day) by level of schooling ( $p<0.01$ ). However, not all ad types were found to have the same effect for youth of different ages. For example, for high school students (approximately 15-17 years old), health ads were found to have a greater impact on smoking behaviour (-0.02 for cosmetic vs. -0.20 for health) ( $p <.01$ ), intentions to start (0.09 for cosmetic vs. -0.50 for health) ( $p< 0.05$ ), and intentions to quit (-0.02 for cosmetic vs. -0.64 for health) ( $p <.01$ ). For junior high students (approximately 12-14 years old), cosmetic ads were found to have a greater impact on smoking behaviour (-0.02 for cosmetic vs. 0.18 for health) ( $p <.01$ ), but health ads were found to have a greater impact on intentions to start (-0.01 for cosmetic vs. -0.23 for health) ( $p< 0.05$ ) and intentions to quit (-0.04 for cosmetic vs. -0.13 for health) ( $p <.01$ ).

In a cross-sectional study (+), Sly, Hopkins, et al. (2001) explored the short-term effects of television ads from the Florida Truth campaign on rates of smoking initiation. The researchers found that youth scoring at intermediate (OR 1.3,  $p<.05$ ) and high levels (OR 1.7,  $p<.05$ ) on a media effectiveness index were less likely to initiate smoking than youth who could not confirm awareness of the TV ads. Furthermore, those younger than 16 years of age had an initiation rate 24.3% lower than those older than 16. Those with low scores on the ad effectiveness index and those with high scores were 22% and 40.4%, respectively, less likely to take up smoking than those not affected by the media campaign.

In a cohort study (+), Siegel and Biener (2000) examined the impact of an anti-smoking media campaign administered over a 4-year period by the state of Massachusetts. Youth who were 12 and 13 years of age and had baseline exposure to television anti-smoking ads were significantly less likely to become smokers in the future (OR = -0.49, 95% CI = 0.26-0.93). In contrast, youth who were 14 and 15 years of age were unaffected by television exposure (OR = 0.94, 95% CI = 0.48, 1.83). Among youth who were 12 and 13 years of age at baseline, 30.8% of those exposed to the campaign had an accurate perception of youth smoking prevalence at follow-up, compared to only 13.3% of unexposed youth ( $p = 0.001$ ). A comparable difference was not found among youth aged 14 and 15 years at baseline.

Grandpre et al.'s (2003) RCT study (+) analysed the impact of pro- and anti-smoking messages on a variety of outcomes, including participants' intended behaviour, evaluations of message sources, and seeking of disconfirming information. Messages were created and delivered through personal computers to students in grades 4, 7, and 10. Analysis of video evaluation resulted in a significant main effect for grade in the students evaluation of the video ( $F[2, 609]= 4.144$ ,  $p=0.016$ ,  $n^2= 0.013$ ). Students in the seventh grade provided the most positive evaluations of the video ( $M = 2.70$ ), whereas students in the tenth grade ( $M = 2.93$ ) and students in the fourth grade ( $M = 3.00$ ) provided more negative evaluations of the video. In contrast, to students in the fourth grade ( $M = 2.51$ ) and students in the seventh grade ( $M = 2.52$ ), students in the tenth grade ( $M = 2.85$ ) were more likely to report that they felt they were free to make their own decision. The researchers found a significant quadratic trend across grades, ( $F[2, 912] = 7.02$ ,  $p = .001$ ). For all message types and positions, students in the fourth grade had the most negative views of the source

( $M = 2.92$ ), followed by students in the seventh grade ( $M = 2.64$ ) and students in the tenth grade ( $M = 2.60$ )- a significant main effect for grade was found for source evaluation ( $F[2, 606]=5.901, p=0.003, \eta^2=0.020$ ). Finally, there was a significant main effect for overall intent to smoke found between the three grade levels ( $F[2, 599]=58.81, p<0.001, \eta^2= 0.164$ ). Students in the fourth grade indicated the least intent to smoke ( $M = 1.22$ ), followed by students in the seven grade ( $M = 1.57$ ) and students in the tenth grade ( $M= 2.39$ ). On the basis of these findings, the investigators concluded that grade level and message type have a significant effect on the processing of tobacco-related messages.

A cross-sectional study (++) conducted by Johnston et al. ( 2005) provides data on the extent of exposure to anti-smoking media campaigns among youth between 1997-2001, an appraisal of youth reactions to ads, and an examination of how exposure levels and reactions vary by socio-demographic characteristics. Findings revealed that there were significant differences between grades in student responses to whether the anti-smoking ads made them less likely to smoke. In 2001, 8<sup>th</sup> grade students were the most likely to say that the ads had had at least some impact on intent to smoke (58.7%). In contrast, 2001 levels were 44.9% for 10<sup>th</sup> graders and 38.3% for 12 grade students. As a result, anti-smoking media campaigns may be more effective with the younger youth.

Zollinger et al.'s ( 2006) cross-sectional study (-) examined the awareness and impact of anti-tobacco media messages among rural, suburban and urban youth in grades 6, 7, and 8. They found that students in grade 6 thought commercial would prevent children from initiating tobacco use (68.2%, 64.8% and 60.1%,  $P <.001$ ) compared to the students in grade 7 or 8. As a result, this may suggest that campaigns are more effective with younger youth than older youth.

Wakefield and colleagues' ( 2005) cross-sectional study (+) examined emotional reactions to anti-smoking ads among grade 8, 10 and 12 students. To test emotional reactions a survey was conducted to examine a variety of outcomes such as "this ad was clear," "this ad talked down to me," "this ad made me curious to know truth" and "this ad is one I would talk about". Findings revealed that smoking status and grade of respondent were significantly related to response ratings in only 25 (2.9%) and 44 (5.2%) of comparisons, respectively.



**Evidence Statement No. 13***Strength and applicability of evidence*

Evidence from one review (+)<sup>1</sup>, one US-based cohort study (+)<sup>2</sup>, and three cross-sectional (one++, one +, and one-)<sup>3,4,5</sup> studies reveals that for younger youth, media campaigns are more likely to decrease intentions to smoke and improve smoking behavior by decreasing: initiation rates and continuation of current smoking. Similarly, one review (+)<sup>6</sup> suggests that older youth are less affected by anti-tobacco industry campaigns since they have the least awareness of, and receptivity to, mass media messages. In order to target this group, they suggest using campaigns that appeal to the general population, rather than just youth.

Conversely, one cross-sectional study (+)<sup>7</sup> found that older youth demonstrated greater change in behavioural intentions after exposure to a media campaign. As well, one cross-sectional (+)<sup>8</sup> study testing emotional reactions to smoking ads, only found a weak relationship between age and response.

Evidence from one RCT study (+)<sup>9</sup> found that message content differentially impacts the outcomes of the campaign (how often youth smoke, number of cigarettes smoked, intentions to start smoking, and intentions to quit), depending on the age of the students. In general, health messages were more effective in changing smoking behavior (how often youth smoke, how long they have been smoking, and the number of cigarettes smoked), intention to start smoking and intention to quit smoking for older students, while cosmetic messages were more effective in changing smoking behavior (how often youth smoke and the number of cigarettes smoked) for younger students. In another RCT (+)<sup>10</sup> study, the investigators also concluded that age and message types have a statistically significant impact on the interpretation of tobacco-related messages. Older youth were less likely to positively accept *explicit* anti or pro tobacco messages that limited their internalized decision making, compared to younger children.

1. Wakefield et al., 2003
2. Siegel et al., 2000
3. Johnston et al.,
4. Sly, Hopkins, et al., 2001
5. Zollinger et al., 2006
6. Schar et al., 2005
7. Shegog et al., 2005
8. Wakefield et al., 2005
9. Smith et al., 2006
10. Grandpre et al., 2003

Applicability: None of these studies were conducted in the UK. It is not clear if findings are directly relevant.

*Ethnicity*

The literature examining the impact of ethnicity on the effectiveness of mass media campaigns has produced inconclusive results. Johnston et al.'s (2005) cross-sectional study (++) of anti-smoking media campaigns among youth between 1997-2001 indicated that, African Americans (OR 1.8, p<.001) and Hispanics (OR 1.2, p<.01) reported being impacted by anti-smoking ads more than whites among 10<sup>th</sup> and 12<sup>th</sup> graders. This may have been due to the fact that both Hispanic and African

American students had higher odds of recalled exposure for all grades compared to White students (OR= 1.2-1.3 for Hispanic; OR=1.5-1.8 for African Americans). Both African American and Hispanic students had higher odds than Whites of perceiving some or more exaggeration in anti-smoking advertising (ORs 1.3-1.7 and 1.4-1.7, respectively).

Wakefield and colleagues' ( 2005) cross-sectional study (+) examined emotional reactions to anti-smoking ads. Although there was a lack of information and detail, findings revealed that there were no consistent significant relationships between outcomes and ethnicity since only 4.2% of the response rating outcomes were significant.

Shegog and colleagues ( 2005) conducted a cross-sectional study (+) in which they evaluated the effectiveness of a web-based tobacco prevention programme called Headbutt in changing the intent to smoke among youth. The researchers found that the programme had a greater impact on intentions not to smoking among Hispanic and White students than Black students ( $p = 0.001$ ).

#### **Evidence Statement No. 14**

##### *Strength and applicability of evidence*

A variety of studies explored the impact of ethnicity on the effectiveness of youth interventions. One (++)<sup>1</sup> cross-sectional study revealed that African Americans and Hispanics were more affected (defined as the level to which youth report advertising has made them less likely to smoke cigarettes) by anti-smoking messaging than White youth. Evidence from one cross-sectional (+)<sup>2</sup> study found no relationship between ethnicity and emotional reaction to anti-smoking messages. Finally, one (+)<sup>3</sup> cross-sectional study found that a web based tobacco prevention programme had a greater impact on intentions not to smoke among Hispanic and White students than Black students.

1. Johnson et al., 2005
2. Wakefield et al., 2005
3. Shegog et al., 2005

**Applicability:** As these studies deal with specific populations in the USA, it is unclear how applicable these findings are to a UK setting.

##### *Other Variables*

In a cross sectional study (+), Straub and colleagues ( 2003) set out to determine the effects of pro- and anti-tobacco ads on non-smoking adolescents' intentions to smoke in a single cohort. When examining which variables were significant predictors of intentions to smoke, the researchers found that recognition of brand of favourite ad ( $p=0.01$ ), willingness to use or wear tobacco branded products ( $p=0.0008$ ), stress ( $p<0.0001$ ), and having friends who smoke ( $p<0.0018$ ) increased intentions to smoke. In contrast, agreement with anti-tobacco advertising ( $p<0.0001$ ) and having a live-in father who smokes ( $p<0.0065$ ) decreased intentions to smoke.

In a cross sectional study (+), Unger and co-workers ( 2001) examined whether various measures (i.e., receptivity to tobacco marketing, affective responses, perceived pervasiveness of pro- and anti-tobacco marketing, recall and recognition of specific ads) were related to smoking status. Their findings revealed that perceived pervasiveness of anti-tobacco marketing was higher among participants who were established smokers than participants who had never smoked ( $p<0.05$ ) or were

susceptible to smoking ( $p < 0.0005$ ) (susceptibility is measured as interest in smoking uptake); scores were lowest among those who were susceptible to smoking. Recognition of specific anti-tobacco ads was higher among participants who were established smokers than participants who had never smoked ( $p < 0.05$ ) or were susceptible to smoking ( $p < 0.005$ ); again, scores were lowest among those who were susceptible to smoking. On the basis of their findings, Unger et al. concluded that tobacco-related marketing efforts among adolescents must consider a multitude of cognitive processes, including recognition, recall, comprehension, and attitudinal change.

#### **Evidence Statement No. 15**

##### *Strength and applicability of evidence*

One cross-sectional (+)<sup>1</sup> study found that a number of variables were associated with a greater intention to smoke, including: brand recognition, willingness to use or wear products with tobacco brands, stress and having friends who smoke. Having a live-in father who smoked, and agreeing with anti-tobacco ads were both associated with a lesser intention to smoke. Evidence from one cross-sectional (+)<sup>2</sup> study found that youth who smoked demonstrated a greater awareness of the pervasiveness of anti-smoking campaigns than among youth who had never smoked or who were susceptible to smoking.

1. Straub et al., 2003
2. Unger et al., 2003

Applicability: Since neither of the studies were conducted in the UK it is not clear if findings are directly relevant.

#### *Key Informants*

Brian Crook (The Bridge) commented that mass media can be more effective if appropriately targeted. From his experience, and research, mass media campaigns need to target by age and gender as girls/boys and youth of differing ages have different interests and perceived benefits of smoking. Pierre Sequier (HELP) also commented that age does matter in the effectiveness of a mass-media intervention. He stated that younger people are more affected by campaigns than older people.

Four key informants (Ruth Bosworth, QUIT; Lawrence Moore, University of Cardiff; Martin Raymond, Cloudline; & Hein de Vries, Maastricht University) emphasised the importance of gender in determining the effectiveness of campaigns. Ruth Bosworth (QUIT) felt very strongly that there has been a lack of gender-specific 'messaging' in tobacco control. However, she described how QUIT's most recent webfilms were developed specifically for boys and girls in recognition of the fact that prevention messages, language and images may differ between the sexes. Martin Raymond (Cloudline) thought that it was more important to target by gender than by socio-economic status as there are more significant gender differences in young people's interests, aspirations, media (eg magazines) and social worlds.

Lawrence Moore (University of Cardiff) also highlighted some interesting gender differences that were identified by the ASSIST study. According to this study, which was conducted in schools in Wales, there were significant differences in the 'place' of smoking in the lives of young people. For example, the 'popular' boys (who have influence with their peers) tended to be sporty and athletic, or at least interested in sport. This had a powerful protective effect on smoking uptake – i.e. these boys saw

little appeal in smoking because it could undermine their sporting ability or was not part of the sporting image. In contrast, the 'popular' girls were much more likely to be smokers. Smoking was associated with remaining slim and was seen as rebellious and attractive. Because of these differences, anti-smoking messages may have to be conveyed differently to boys and girls. On this note, Hein de Vries (Maastricht University) mentioned that tailoring can be very important in order to get prevention messages 'right'. Messages that communicate effectively to young boys will not necessarily appeal to young girls and vice versa.

Three key informants mentioned the significance of ethnicity on the effectiveness of mass media campaigns. For example, Hein de Vries (Maastricht University) stated that findings from the EFSA study revealed, for example, that the intervention in the Netherlands was more effective amongst immigrant children than amongst native Dutch children. Although he did not expand, he felt that ethnicity may be one important factor in affecting how mass media campaigns are received, interpreted and understood. Martin Raymond (Cloudline) thought that issues around ethnicity had not been given enough attention. While there was little research on this he thought that locally tailored rather than national campaigns might be more effective. Finally, Ruth Bosworth (QUIT) mentioned that QUIT tailors their cessation material to different ethnic groups but does not currently do this with their prevention materials.

In terms of socio-economic status, Brian Crook (The Bridge) Ruth Bosworth (QUIT) and Cameron Norman (University of Toronto) had slightly different opinions regarding the effectiveness of the campaigns based on the socio-economic status of the targeted audience. Brian Crook and Ruth Bosworth were concerned that the new media interventions, for example the internet, may not be accessible for young people from lower socio-economic groups. In contrast, Cameron Norman (University of Toronto) found that students had equitable access when interventions were set up in schools. Additionally, Hein de Vries (Maastricht University) made a number of interesting observations about the need to more effectively explore what works with low income young people in preventing smoking. He feels that very little research has been done on how images might be used more effectively in prevention, particularly with lower income groups. He went on to comment that some campaigns may rely too heavily on text to communicate their message, which could limit their impact with some audiences. Hein suggested that it might be beneficial to explore greater use of pictures or pictograms, particularly to reach some groups.

### **3.8 What are the facilitators and barriers to implementation?**

No studies were identified that specifically addressed facilitators or barriers to the implementation of mass media campaigns to prevent smoking in children and youth. However, many studies addressed this issue indirectly. For example, Schar et al.'s (2005) review (+) suggests that TV mass media campaigns are only effective if audiences receive adequate exposure to them. Messages must appear frequently enough for audiences to notice them and internalise them; only then can attitudinal and behavioral change occur. Similarly, Lantz and colleagues' (2000) review (+) suggests that mass media interventions can be successful only if they are of sufficient duration. The authors argue that "one shot" campaigns are not likely to induce behavioural change. Rather, multi-year campaigns that use a social marketing approach must be developed and implemented.

### Evidence Statement No. 16

#### *Strength and applicability of evidence*

No studies specifically examined facilitators or barriers to the implementation of mass media interventions. Yet, two (+)<sup>1,2</sup> reviews suggest that mass media interventions are most effective when they are longer in duration and greater in intensity of exposure. Schar et al. cites the guidelines developed by the former Chief of the Health Communications Branch at the Center of Disease Control (CDC) in the U.S. According to these guidelines, ads should be aired for a minimum of 6 months to affect awareness and up to 24 months to have an impact on behaviors; ads should also be aired as continuously as possible, particularly within the first 6 months of a campaign. Lantz contends that mass media interventions should be large, intense and of “sufficient duration” but does not explicitly define the terms duration or intensity.

1. Schar et al., 2005
2. Lantz et al., 2000

**Applicability:** Both studies were conducted in the USA. However, given the nature of exposure to mass media campaigns findings may be applicable to the UK.

#### *Key Informants*

A number of barriers to the effective implementation of mass media messages were highlighted by the key informants. Key barriers that were identified include the lack of funding, tailoring, consistent themes, longevity and staying up to date with technology. (Facilitators outlined by the key informants have been highlighted throughout the other research questions).

#### *Tailoring*

Amanda Sandford (ASH) and Pierre Sequier (HELP) highlighted that there is some evidence to suggest that the lack of tailoring of interventions to young people can act as a barrier to the effective implementation of mass media interventions. Amanda Sandford commented that interventions should consider and focus on the specific needs of subgroups. This was echoed by Pierre Sequier who highlighted that many challenges exist when attempting to use the same message for diverse people (he provided the example of trying to position the HELP campaign so that it would be relevant to, for example, young people in Denmark as well as those in Italy). Finally, Ruth Bosworth (QUIT) mentioned that a barrier to effective interventions can be organisational or cultural resistance to tailoring. For example, implementing gender-specific interventions has often received resistance.

#### *Common Themes*

Another barrier highlighted by Pierre Sequier (HELP) is creating a common creative theme for all mass media interventions in the UK. This can be particularly challenging when faced with competing campaigns. To highlight this point, Pierre commented that it is possible that local campaigns have a different agenda than broader campaigns. One campaign might stress the negative health aspects of smoking while another shows the danger of the tobacco industry. Pierre suggested that this can lead to clashes and confusion among viewers.

#### *Funding and Longevity*

Lack of sufficient funding and longevity was a large barrier identified by four key informants. This was discussed from both a campaign point of view and a research point of view. For example, Cameron Norman (University of Toronto) stated that most funding bodies do not want to fund ongoing technological projects (which can make it hard to develop and maintain a website over an extensive period of time). As

a result, Cameron Norman (University of Toronto) noted that many projects are short-lived because researchers cannot obtain sufficient funding to invest in ongoing development.

Similarly, Gerard Hastings (University of Stirling) mentioned that a barrier for effective mass media campaigns is the lack of longevity of interventions. In his opinion, in order to fight against the prevalent and well-established tobacco industry, long term strategies and programmes are needed. Unfortunately, he noted that mass media interventions in the UK have often been short lived. He reflected on experiences in Scotland and elsewhere in the UK where campaigns have been changed or ended just at the point when they were becoming widely recognised and potentially effective. Furthermore, Hein de Vries (Maastricht University) asserted that short time frames, limited funding, problems of attribution and the need to integrate approaches into complex interventions can make it difficult and expensive to produce effective mass media campaigns.

#### *Staying Up to Date*

Ruth Bosworth (QUIT), Martin Raymond (Cloudline), and Cameron Norman (University of Toronto) highlighted the challenge of staying up to date with the rapidly changing field of new media. For example, Ruth commented that the key forms of media for communicating with young people are changing so quickly, that by the time an intervention is evaluated technology has taken on a new form. As a result, Ruth noted that this can require programme developers to be cautious and use their resources wisely. Martin Raymond (Cloudline) reflected on the experience of Young Scot (an organisation for young people) which has a website that receives over 2 million hits each month. Even though this is run by young people it has proved difficult to keep up with the changes in technology and interests. Finally, in reference to websites, Cameron Norman (University of Toronto) stated that in order to stay current and up to date, another challenge is the need for ongoing maintenance and technical expertise.

### **3.9 How would differences between the comparators used in published studies and the prevailing situation in England impact on the analysis of effectiveness?**

The majority of studies identified in the literature examining the effectiveness of mass media interventions were conducted in the US. These studies highlighted a variety of campaigns that were specific to the US. A key campaign that has been examined in detail is Florida's "TRUTH" campaign. The focus of this campaign is to draw attention to the deceptive practices of the tobacco industry. Although this type of message has been effective in the US, revealing the deceptive practices of the industry may be less successful in the UK. In a comparative study of young people's responses to anti-smoking messages in the UK, Devlin et al. (2007) found that the industry manipulation approach was not understood by all participants, and therefore may be less successful. They argue that before this type of messaging can be effective, more education on this issue is needed in the UK. As a result, it is not possible to determine if it would be as effective in the UK. However, it is recognised that attitudes in the UK towards smoking, smoking bans and restrictions, and the protection of non-smokers have changed over recent years. As a result, government campaigns may help to establish the necessity for an anti-tobacco industry campaign mind-set.

Another factor influencing the applicability of evidence to the UK is the fact that the demographics of those studied in international contexts do not reflect that of the UK.

In the US, a variety of studies have focused on the impact of interventions on Latinos, African Americans, and Whites. Yet there is very limited, if any, evidence regarding the effectiveness of interventions by socio-economic group. This poses problems for the direct applicability of this evidence to the UK. As smoking is increasingly concentrated in lower income groups in all parts of the UK, it is important that mass media interventions are able to reach these groups and include messages which are meaningful for lower income young people. The fact that most of the international studies reviewed here did not disaggregate their findings by socio-economic group may therefore limit their applicability to the UK context.

Finally, it is important to note that the US and UK may experience different trends in smoking uptake, maintenance and cessation. This further contributes to the uncertainty about whether the results from this review are directly applicable to the UK. However, it is important to note that many similar factors influence access and uptake of cigarettes among youth in both the US and UK. For example, some important generic lessons can likely be transferred across continents. This is especially true regarding the need to tailor mass media interventions to the needs of diverse youth, the need to stay current with new technologies, and the need to use appropriate messages and modes of delivery.

#### **Evidence Statement No. 17**

##### *Strength and applicability of evidence*

It is not clear whether the results of the literature identified will be directly applicable to the UK. The majority of studies reviewed were based in the USA. However, some important generic lessons can likely be transferred across continents. To determine the effectiveness of youth access restrictions in the UK, more UK specific research is needed.

##### *Key Informants*

Three key informants indicated that there are a number of problems with transferring international evidence about mass media to the UK context. For example, Gerard Hastings (University of Stirling) noted that the UK data has a much greater focus on socio-economic inequalities between groups than many other countries where prevention research has been conducted. He also said that inequalities in the UK are not necessarily greater than other developed countries, but that the UK has a longer tradition of collecting data on these differences. Yet, he acknowledged that there were particular challenges in trying to define and describe differences between groups of young people based on social class, etc. For example, Gerard felt that published evidence on young people may not account for important differences between social groups. In particular, it is important to consider cultural differences, such as those that exist between ethnic groups in the UK and the USA.

Two key informants talked about the relevance of the mass media campaign "Truth" within the UK context. Findings from this campaign have been widely published and disseminated and have been included in this review. Amanda Sandford (ASH) noted that at least one important cultural difference exists in the UK regarding beliefs about smoking, which limits the potential transferability of this intervention. She pointed out that the general public in the UK and the media still appear to regard smoking as an individual choice. In addition, the UK does not yet have an anti-tobacco industry mind-set. In comparison to the UK, Amanda felt that there was some evidence of increased awareness in the US about how the tobacco industry benefits from

nicotine addiction, and encourages youth to start smoking. Similarly, Karen Gutierrez (tobacco control) agreed that the findings of the “Truth” campaign may not be relevant to the UK. She noted that using mass media to highlight the deceptive practices of the tobacco industry has not been used extensively outside of the US.

Although Lawrence Moore (University of Cardiff) agreed that there are a number of challenges with translating international evidence about mass media to the UK context, he also thought that tobacco control strategies could benefit from the experiences of other countries (Brian Crook made similar comments about the applicability of broad findings but recognised that campaigns need to be developed from the ground up). For example, in Norway Hein De Vries commented that they have seen a significant reduction in smoking amongst teenagers. They have had an effective school based prevention programme that engages both parents and youth, and have introduced smoke-free legislation which may support the prevention and cessation of smoking in youth.

Finally, one key informant, Ruth Bosworth (QUIT), argued that Quit have used a range of evidence to inform the design of their campaigns. While most of this data has come from the UK and is linked with UK academics (Robert West sits on their board of trustees, for example, and they have involved a number of academics in evaluations of their work), they have also integrated evidence from European (EU Network of Quitlines) and overseas links. However, she did not elaborate on any problems with using international evidence to inform the design of campaigns in the UK.



#### 4 Summary of Findings: Which interventions are effective in reducing the illegal sale of tobacco to children and young people?

There is evidence that access restriction interventions impact effectiveness in terms of the number of sales to young people, young people's ability to access cigarettes and merchant compliance. There was a lack of information regarding whether interventions impact behaviours, attitudes, beliefs, intentions or perceptions. Only two studies addressed the impact of interventions on smoking behaviour. Factors that have been shown to influence number sales, young people's ability to access cigarettes and merchant compliance include active enforcement, comprehensive interventions, interventions produced by tobacco control bodies, requesting age/proof of ID, demographics of the vendor/merchant, site setting of the access intervention, and the demographics of the target audience. Overall, the factors outlined above work best when combined with requesting proof of age/ID, active enforcement (in relation to both retailer-youth purchaser and trading standards-retailers) and other youth prevention strategies.

##### 4.1 When appropriate interventions can be compared, which are most effective?

No studies identified by the literature search specifically compared interventions aimed at preventing the illegal sale of tobacco to youth. However, DiFranza and co-workers (1992) (cross sectional, -) studied the effectiveness of tobacco industry interventions (rather than tobacco control interventions). The authors examined the effectiveness of the "It's the Law" campaign 7 months after its launch in the US. They found that six of the seven participating merchants (86%) and 131 of the 149 merchants (88%) who were not participating in the program were willing to illegally sell cigarettes to children. When state-mandated warnings were used, 80% (49 out of 61) of merchants were willing to illegally sell tobacco to children. As a result, the authors conclude that the Tobacco Institute's "It's the Law" program failed in its mandate to prevent the illegal sale of tobacco to youth, and that active enforcement would be more effective.

##### **Evidence Statement No. 18**

###### *Strength and applicability of evidence*

One cross sectional (-)<sup>1</sup> article found that a tobacco industry sponsored campaign within the US did not significantly reduce the sale of tobacco to minors, yet state mandated warnings were only slightly more successful in reducing youth's ability to purchase tobacco. Tobacco industry interventions may not prevent the illegal sale of tobacco to children and youth; active enforcement of tobacco sales laws by health officials may be more effective.

1. Di Franza et al., 1992

Applicability: Findings are not applicable to the UK since the findings are specific to a US-based tobacco industry campaign.

#### **4.2 Are the interventions delaying rather than preventing the onset of smoking?**

No studies identified in the literature search specifically examined whether interventions were delaying rather than preventing the onset of smoking in children and youth. Nearly all of the studies identified by the literature search looked at the effect of access restrictions on illegal sales (eg number of sales to youth, merchant compliance) not the effect on behaviour or prevention of uptake. As a result, it is not clear what impact access restrictions are having on smoking behaviours. However, Ross and colleagues (2006) examined the differential effects of cigarette prices, clean indoor air laws, and youth access laws on smoking uptake among US high school students (cross sectional, +). Compliance with youth access laws reduced the probability of being in higher stages of smoking uptake ( $p < 0.05$ ). The impact of compliance is larger for those who are in later stages of uptake, which supports the hypothesis that social sources of cigarettes are more important in the earlier stages of smoking uptake. The authors suggest that when consumption reaches a certain level, a consumer moves to higher uptake stages and retail sources become much more important. Therefore, adolescents who are closer to the completion of smoking uptake are primarily affected by merchant compliance with youth access laws. At the early stages of smoking uptake, cigarettes may be obtained from friends or from other social sources. These consumers may not respond as strongly to the merchant compliance. These findings indicate that interventions may have differential impacts on the ability to access tobacco, depending on their stage of smoking.

Interestingly, one review found no difference in youth smoking rates in communities

#### **Evidence Statement No. 19**

##### *Strength and applicability of evidence*

No studies in the review examined whether interventions were delaying rather than preventing the onset of smoking. For the most part, studies identified examined the effect of access restrictions on illegal sales (eg number of sales to youth, merchant compliance) not the effect on behaviour or prevention of uptake. One US-based cross-sectional study (+)<sup>1</sup> did find that interventions impacted youth's stage of smoking uptake. Stage of smoking uptake was rated on a continuum of 1 to 5, with stage 1 being someone who has never smoked and has no intention to smoke, and stage 5 being someone who currently smokes, has smoked at least 100 cigarettes and has no intention to quit. Evidence from this study suggests that compliance with youth access laws reduces the probability of being in higher stages of smoking. Youth who are in earlier stages of smoking depend more on social sources for acquiring tobacco. Interestingly, evidence from one American review (+)<sup>2</sup> shows no difference in youth smoking rates between communities with and without greater merchant compliance with sales restrictions.

1. Ross et al., 2006
2. Fichtenburg et al., 2002

**Applicability:** The findings are in relation to two US-specific interventions. It is not clear if findings are directly applicable to the UK.

with and without interventions. In an American based systematic review (+), Fichtenburg and colleagues ( 2002) examined the effectiveness of laws restricting youth access to cigarettes. Based on data from 9 studies, there was no difference in youth smoking in communities with youth access interventions compared with control communities; the pooled estimate of the effect of interventions on 30-day prevalence was -1.5% (95% confidence interval; -6.0% to +2.9%). Interventions ranged from simple enforcement of laws to retailer and community education, to education combined with active enforcement via compliance testing, warnings, fines and suspension of tobacco selling licenses. All four controlled studies included in the review reported merchant compliance of 82% or higher, yet failed to result in decreased smoking by youth. As a result, this evidence suggests that findings are not clear regarding whether interventions are actually preventing or delaying the uptake of smoking.

#### **4.3 How does the way that the intervention is delivered influence effectiveness?**

##### *Comprehensive Interventions*

A variety of studies discuss the utility of multi-faceted interventions for decreasing youth access to tobacco products. These findings suggest that interventions are most effective when they are comprehensive, but that this can be undermined by weak enforcement of tobacco laws. Similarly, English survey data (ONS, 2007) reports that increasing the minimum age law in the England from 16 to 18 will only be effective if it is properly enforced and part of a broader set of actions aimed at discouraging young people from smoking.

Stead and Lancaster (++) ( 2005) examined how interventions aimed at preventing illegal sales of tobacco can reduce underage access. None of the strategies achieved 100 per cent merchant compliance. Yet, the authors concluded that actively

enforcing the law or using multi-component educational strategies was more effective than providing merchants with information about illegal sales. The report also suggests that interventions (such as education, law enforcement, community mobilisation) with merchants can decrease the number of outlets selling tobacco to youth. Chaloupka and Grossman (1996) also found multi-component interventions to be most effective for decreasing youth access to tobacco. In their US-based cross-sectional study (1996) (+), they examined the effectiveness of various tobacco control policies, including: increased taxation, restrictions on smoking in public spaces and worksites, and limiting the availability of tobacco products for youth. They found that a lack of enforcement diminished the potential impact of these policies for reducing youth smoking. For example, minimum purchasing age restrictions were not well enforced and had little impact on young people unless coupled with educational programs, licensing, and fines. Likewise, restrictions on vending machine sales of cigarettes, machine placement, and requirements for locking devices were not well enforced and ineffective without multi-component interventions.

Several studies, including a review by Lantz and colleagues (2000) (+) discussed the benefit of active enforcement as part of comprehensive interventions. For example, a study by Tutt et al. (2000), (cross sectional, -) explored retail compliance with prohibition of sales to minors. Prohibition of sales was monitored through a series of undercover compliance surveys between 1993 and 1999. Compliance rates were affected by a campaign aimed at increasing merchant awareness of their obligations under the new law and well publicised prosecutions. Findings revealed that compliance rates increased as a result of publicised prosecutions and a campaign aimed at increasing merchant awareness. For example, in December 1994 non-compliance was 30.8%, in May 1996 it was 8.1% and in 1998/9 non-compliance was 0%.

Similarly, a New Zealand based cross-sectional study (-) (Price, Allen 1998) evaluated the effectiveness of the Smoke-free Environment Act of 1990, which prohibits the sale of tobacco products to minors. This study evaluated a nationwide programme of controlled purchase operations (CPOs) using volunteers under the age of 16. Between September 1996 and June (1997), 9.7% illegal sales of tobacco occurred. Between July and December 1997, 5.9% resulted in sales to volunteers. Therefore, from September 1996 to December 1997, a total of 980 CPOs were conducted, resulting in 84 (8.6%) sales of tobacco products to minors. As of December 1997, 41 (84%) of the violating merchants were convicted and eight were discharged without conviction. Fines incurred by convicted merchants ranged from \$100 to \$750 (inclusive of cost). According to these studies, active legal enforcement is useful for decreasing illegal sales of tobacco to minors.

A review (+) by Levy and Friend (2002) found that youth and merchant interventions are most effective when combined with active enforcement of tobacco laws. Their (2002) (+) review of youth access policies investigated the impact of various interventions on youth smoking rates. The researchers found that successful policies that reduced retail sales usually had a multi-component approach that included severe enforcement and penalties, as well as community education and mobilisation. For example, two studies in this review (Skretny et al 1990 & (DiFranza, Brown 1992) reveal that merchant education may promote voluntary compliance but is ineffective on its own in reducing tobacco sales. Community and media campaigns also have a limited effect when enforcement efforts are not also present. For example, although some stores may stop selling to youth because of youth access policies, other stores may increase their sales. The latter is more likely if merchants perceive that they are unlikely to get caught, and that if caught, they are unlikely to be penalised in any

meaningful way, or that the community is not concerned about this issue. Lastly, their review found that vending machine policies that involve community and merchant education without locking devices or total vending machine bans have limited effects on sales to youth. Their review also reveals that many intervention outcomes were not sustainable.

**Evidence Statement No. 20***Strength and applicability of evidence*

One (++)<sup>1</sup> Cochrane review and one US- based cross-sectional study (+)<sup>2</sup> found that multi-faceted interventions (active enforcement, multi-component educational strategies, and increased taxing and restrictions on smoking in public places respectively) are most effective for reducing youth's ability to access tobacco, particularly when combined with ongoing and active enforcement of minimum age restrictions. Similarly, English survey data indicates that a broad set of actions is the key to successfully increasing minimum age laws. Active law enforcement has been identified by one review (+)<sup>3</sup> and 2 cross sectional studies (-)<sup>4,5</sup> as an important part of multi-component interventions. Evidence from one review (+)<sup>6</sup> suggests that vending machine policies are most effective at reducing youth access to tobacco when combined with locking devices or complete vending machine bans.

1. Stead et al., 2005
2. Chaloupka et al., 1996
3. Lantz et al., 2002
4. Tutt et al., 2000
5. Price, 1998
6. Levy et al., 2002

**Applicability:** The majority of the studies took place outside of the UK in a wide range of countries, including Australia, the USA and New Zealand. However, it is likely that their findings are applicable to the UK, given the broad similarities in the impact of enforcement.

*Requesting ID*

Landrine and colleagues (1996) (+) investigated the utility of age and/or identification requests for decreasing illegal sales to minors. The researchers found that cashier's rarely requested age or ID despite California law requirements. In 2567 trials, minors were asked their age 13.1% of the time and were asked to produce ID 4.1% of the time. Asking for ID affected sales more than asking age. Although requesting age decreased the sale of tobacco to 16 year olds from 57.2% (when neither age/ID was requested) to 8.5% of the time, requesting ID decreased sales to 2.4% of the time. When age was asked, minors were refused cigarettes 95.8% of the time and sales decreased ( $P = 0.000005$ ). When ID was requested, minors were refused cigarettes 99% of the time and sales decreased ( $P = 0.00004$ ).

Other researchers have also found that age and/or identification requests have an impact on access to tobacco. For example, a cross sectional study (DiFranza, Celebucki, Mowery 2001) (+) evaluated merchant compliance with laws prohibiting the sale of tobacco to minors. Findings revealed that sales occurred in 1.5% of 1180 attempts when proof of age was requested, as compared to 64% of 712 attempts when it was not ( $P < .001$ ). Sales occurred in 5% of 317 attempts when age was asked, and in 30% of 1502 attempts when it was not ( $P < .001$ ). Crude violation rates (referring to the overall rate for an entire population) were 35% for 1996 and 17% for 1997 ( $P < .001$ ). In their cross-sectional study (++) , Glanz et al. (2007) found that only 2 variables were associated with whether a successful purchase attempt was made: whether minors' age (OR = .030, 95% CI = .002, .426) or identification was requested (OR = .001, 95% CI = .001, .020). These findings suggest that age and/or

identification requests may be an effective means by which to decrease youth access to tobacco products.

Yet youth who present identification may still be successful in purchasing tobacco. In a non-randomised controlled trial (+), Levinson and coworkers (2002) examined the effect on cigarette sales when minors presented ID. Sixteen minors conducted supervised tobacco purchase attempts in six urban and suburban communities in the US. Findings revealed that when clerks requested ID, sales were more than 6 times more frequent when minors presented ID than if they did not (12.2% vs. 2.0%, RR = 6.2,  $p < 0.0001$ ).

#### **Evidence Statement No. 21**

##### *Strength and applicability of evidence*

Two cross-sectional (+)<sup>1,2</sup> US-based studies found that when merchants requested proof of age, illegal sales decreased. There is some evidence that asking for identification decreases illegal sales more than asking for age. Yet evidence from a non-RCT study (+)<sup>3</sup> in the US suggests that minors who present ID are more successful when purchasing tobacco than those who do not. Therefore, while cashier compliance with enforcing age restrictions can decrease youth's ability to purchase tobacco, evidence suggests that this will be most effective when stringent verification of ID occurs.

1. Landrine et al., 1995
2. DiFranza et al., 2001
3. Levinson et al., 2002

**Applicability:** Since none of these studies were conducted in the UK it is not clear if findings are directly applicable to the UK.

#### **4.4 Does effectiveness depend on the status of the person (e.g., peer, parent or teacher) delivering it?**

Multiple studies have examined how access to tobacco may be impacted by the persons involved. Researchers have found varying correlations based on: involvement in the intervention/program, and the age, gender and ethnicity of the potential merchant.

One study found no difference between merchants who did or did not participate in a compliance program. In their cross-sectional study (+) exploring a tobacco industry-sponsored "It's the Law" compliance program, DiFranza et al. (1996) concluded that participants and non-participants of the compliance program were just as likely to make illegal sales to minors (OR = .87, (95% CI = 0.59, 1.35) (P = .0001).

Other studies reveal that illegal tobacco sales may be impacted by the age, gender or ethnicity of the clerk. In a non-randomised controlled trial (+), Levinson and coworkers (2002) found that during supervised purchase attempts, clerks perceived to be younger than 30 years of age were significantly more likely to sell tobacco to youth (9.9% of clerks under 30 made sales vs. 5.5% of clerks between 30-50 and 6.9% of clerks over 50). Odds of sales were also higher on weekdays than weekends.

In a cross sectional US-based study (DiFranza, Celebucki, Mowery 2001) (+), researchers found that illegal sales were more common when the youth purchasing the tobacco were older, and when the clerk was a man. In general, male clerks made more illegal sales than female clerks (27% vs. 22%;  $P < .05$ ). In a cross sectional study (+) by Landrine and colleagues (1996), findings revealed that the gender of the clerk did not play a role in identification request ( $\chi^2(1) = 0.05$ ) or age request ( $p = 0.07$ ). However, female clerks (32.4% of the time) were slightly more likely than male clerks (26.3% of the time) to ask children their age. The interaction between the child's and clerk's gender was not found to significantly impact age or identification requests.

Landrine and co-workers (1996) (cross sectional +) found that the clerk's ethnicity was also associated with age requests ( $p = 0.0006$ ). For example, Asian clerks requested age more often than other ethnic groups (35.5%), followed by African American clerks (22.7%), Middle Eastern clerks (21.7%), White clerks (17.5%) and Latinos (8.5%). Ethnicity also played a role in requesting ID ( $p = 0.0004$ ). White clerks asked for ID 18.5% of the time, Latino's asked 15% of the time, Asians asked 7.5% of the time, Middle Eastern clerks asked 6.6% of the time and African Americans asked 2.3% of the time.

#### **Evidence Statement No. 22**

##### *Strength and applicability of evidence*

In one cross sectional study (+)<sup>1</sup>, clerks participating in a compliance program were as likely to make illegal sales of tobacco to youth as clerks who were not participating in the compliance program. However, US-based evidence from one (+)<sup>2</sup> non-RCT and two cross-sectional (+)<sup>3,4</sup> studies suggests that the age, gender and ethnicity of the person delivering an intervention influences the outcomes. Overall, younger merchants are more likely to sell tobacco illegally to a minor, identification is less likely to be requested and an illegal sale is more likely to occur when the merchant is a man. Some evidence also suggests that ethnicity may influence intervention outcomes; Asian clerks were found more likely to request age, with White clerks most often requesting identification.

1. DiFranza et al., 1996
2. Levinson et al., 2002
3. DiFranza et al., 2001
4. Landrine et al., 1996

Applicability: All four studies were conducted in the USA. It is not clear if findings are applicable to the UK.

#### **4.5 Does the site/setting influence effectiveness?**

The site/setting of tobacco sales may also influence the ability to access tobacco products among youth. In a Swedish cross sectional study (+), Sundh and co-workers (2004) compared the ability of young people to purchase tobacco before and after the implementation of the minimum age requirement of 18 years. In 1996 and 1999, most of the purchase attempts occurred in both department and grocery stores. In 1999, 66% of purchase attempts in department and grocery stores made by younger looking adolescents were successful (compared to 84% in 1996,  $p < 0.001$ ). In 1999, 78% of attempted purchases at newsstands and in tobacco shops made by adolescents with younger appearances were successful (compared to 96% in 1996,  $p < 0.001$ ). Finally, the results of purchase attempts in service stations were



considerably different between 1996 and 1999. In 1996, 94% of younger looking adolescents successfully purchased tobacco in service stations, compared to 63% in 1999 ( $p < 0.001$ ).

Other researchers have found a relationship between setting and the ability of young people to access tobacco. Glanz and colleagues (2007) examined the potential of the annual inspections to encourage compliance with government legislation to limit minors' access to tobacco products in Hawaii. In this cross-sectional study (++) carried out from 1996-2003, minors aged 14-17 years attempted to purchase tobacco products. Findings revealed that 5.6% of purchases occurred in food stores, 7.5% occurred in convenience stores, 5.7% occurred in gas stations, and 3.7% occurred in other stores.

In particular, the presence of self-service displays and unlocked vending machines may increase young people's ability to access tobacco products. In a cross sectional US-based study (DiFranza, Celebucki, Mowery 2001) (+), the researchers found that illegal sales were comparable for locked vending machines (19% of 47 attempts) and over-the-counter outlets (24% of 1075 attempts;  $P > .05$ ), but were more frequent for self-service displays (37% of 75 attempts,  $P = .01$  vs. over the counter) and unlocked vending machines (64% of 58 attempts,  $P < .0001$  vs. over the counter). Likewise, in a cross-sectional study by DiFranza et al. (1996) (+), the researchers concluded that in communities without requirements for lockout devices, illegal sales were far more likely from vending machines than over-the-counter sources (OR = 3.0, 95% CI = 1.9, 4.7) ( $P = .0001$ ).

Similarly, according to English survey data (ONS, 2007), site and setting does have an impact on the ability of youth to buy cigarettes. Although the proportion of youth who usually purchase cigarettes from a shop has decreased from 89% in 1996, to 78% in 2006, youth are still able to purchase cigarettes from shops. Youth most often report purchasing cigarettes from newsagents, tobacconists or sweet shops (66% reportedly bought cigarettes in these types of shops). Furthermore, 17% of regular smokers bought cigarettes from vending machines. The proportion of young people who buy cigarettes from a shop doubles with each additional year (4% of 11-12 year olds, 9% of 13 year olds, 22% of 14 year olds and 38% of 15 year olds). Finally, girls (18%) in England are more likely than boys (15%) to buy cigarettes from a shop.

**Evidence Statement No. 23***Strength and applicability of evidence*

Evidence shows that site/setting does influence the effectiveness of the intervention, and youth's ability to purchase tobacco. Evidence from one cross sectional (+)<sup>1</sup> study in Sweden indicates that younger looking adolescents were most successful when purchasing tobacco in newsstands, tobacco shops, and service stations (compared to department stores, grocery stores, cafes, restaurants, and video rental shops). Survey data from England indicates that older youth are more successful at purchasing cigarettes than their younger counterparts. Another cross sectional study (++)<sup>2</sup> in the US found that minors were most successful at purchasing tobacco in convenience stores, followed by gas stations and food stores. Survey data from England similarly indicates that youth often buy cigarettes from newsagents, tobacconists or sweet shops. The availability of tobacco vending machines also influences access to tobacco. Two (+)<sup>3,4</sup> cross sectional studies based in the US, found that youth were more successful when purchasing tobacco from unlocked vending machines or self-service displays than from locked vending machines or over-the-counter outlets.

1. Sundh et al., 2004
2. Glanz et al., 2007
3. DiFranza et al., 2001
4. DiFranza et al., 1996

Applicability: All four studies took place outside of the UK. However, it is likely that their findings are applicable to the UK given the broad similarities in the locations where young people purchase cigarettes.

#### **4.6 Does the intensity of the intervention influence effectiveness or duration of effect?**

No studies identified in the review explicitly examined the intensity of access interventions. However, many studies discussed the impact of interventions over time. For example, a cross-sectional study (+)(Tangirala et al. 2006) examined data collected between 2001 and 2003 for the associations among merchant inspections, merchant compliance and access to tobacco by youth. Indiana's Tobacco Retailer Inspection Program (TRIP), a state government programme, was established to implement environmental controls by restricting youth access to tobacco products. The researchers found that out of the 3980 first-time inspections, 1285 (32.3%) resulted in violations for selling tobacco to a minor. A total of 3977 second-time inspections of the same retailers resulted in 1030 attempts (25.9%) to sell tobacco to youth. Results indicate that the percentage of violations in a second re-inspection were fewer than violations at inspection 1 ( $p < 0.05$ ). Overall, the researchers concluded that randomly selected retail outlet inspections are associated with increased sales restrictions to youth.

The implementation of minimum age laws and sustained enforcement of these laws over time by merchants may improve the prevention of tobacco use for youth. In a Swedish cross-sectional study (+), Sundh and coworkers (2006) assessed three test locations to investigate regional differences in tobacco access and inform authorities' efforts to enforce compliance with minimum-age restrictions. In 1996, 84% (n=214) of test purchases in shops with a voluntary age-limit resulted in successful purchases, while in 2005, 48% (n=900) of purchasers were successful ( $p \leq 0.001$ ).

The authors concluded that adolescent opportunities to purchase cigarettes have been reduced by the introduction of the minimum-age law in 1996 and the support of merchants in complying with this law. Furthermore, they observed that from 2002 onwards, efforts were made to improve compliance with the minimum-age law at a community level, which could have also accounted for the reduction in illegal purchases.

In their review (+), Fichtenburg and colleagues (2002) found that teen smoking behaviour was not related to the presence of access restrictions. Based on data from 9 studies, there was no relationship between level of merchant compliance and 30-day ( $r=0.116$ ;  $p=0.486$ ;  $n = 38$  communities) or regular ( $r=.017$ ;  $p=0.926$ ) smoking prevalence. The researchers also concluded that there was no evidence of threshold effect (merchant compliance reaching a level necessary to decrease purchases), and no evidence that increased compliance with youth restrictions was associated with a decrease in 30 day ( $r = 0.294$ ;  $p=0.237$ ;  $n = 18$  communities) or regular ( $r = 0.274$ ;  $p=0.287$ ) smoking prevalence. There was also no significant difference in youth smoking in communities with youth access interventions (aimed at preventing illegal sales) compared with control communities; pooled estimate of the effect of intervention on 30-day prevalence was  $-1.5\%$  (95% CI;  $-6\%$  to  $+2.9\%$ ). Interestingly, the authors note that although these correlations are not significant, they indicate that a positive association exists between increased compliance and increased smoking prevalence.

Finally, results from the review of Levy and Friend suggest that interventions may not be self-sustainable. Levy and Friend's (2002) (+) empirical review of youth access policies found in one study (Altman et al. 1991) that a merchant education programme and media campaign reduced sales from 76 % to 39% shortly after initiation, but rates rose 59% 6 months after the intervention ended.

### Evidence Statement No. 24

#### *Strength and applicability of evidence*

No studies in the review directly studied the intensity of interventions, though some did examine the impact of an intervention over time. Evidence from two (+)<sup>1,2</sup> cross-sectional studies indicate that over time (between 2001-2003, and between 1996-2005 respectively) factors such as successive retail inspections, public prosecutions, awareness of campaigns and implementing a minimum age law result in decreased illegal sales of tobacco. Yet, evidence from one (+)<sup>4</sup> review demonstrates that access restrictions on purchasing tobacco do not impact smoking behaviour, suggesting that decreased access to buying cigarettes doesn't necessarily result in a decrease in smoking. Lastly, according to evidence from a (+)<sup>4</sup> empirical review, interventions may not produce a sustained decrease in the illegal sale of tobacco. The authors do not specify the impact of the interventions on duration of effect; they only state that interventions without complicity checks, significant penalties, and merchant awareness have limited long-term effects.

1. Tangirala et al. 2006
2. Sundh et al., 2006
3. Fichtenburg et al., 2002
4. Levy et al., 2002

Applicability: All four studies to place outside of the UK. As a result, it is not clear if findings are directly applicable.

#### **4.7 How does effectiveness vary according to the age, sex, socio-economic status or ethnicity of the target audience?**

Several studies identified in the literature review highlighted the impact of a variety of demographic factors such as age, sex, and ethnicity on the effectiveness of access restrictions. There was a lack of information on the effect of interventions based on socio-economic status.

##### *Age and Smoking Status*

As outlined by the Cochrane Review (Stead, Lancaster 2005) (++) , access restrictions may have a differential impact on subgroups of smokers depending on their age and smoking status. For example, Stead and Lancaster highlighted a study by Castrucci ( 2002) who indicated that youth who were older or smoked more often were more likely to use commercial sources to buy cigarettes, thereby overcoming access restrictions. Access restrictions may have a greater impact on regular smokers who would encounter these on a more frequent basis. Yet, they also recognised that experienced smokers might employ various techniques (i.e. carrying fake ID, lying about age) in order to obtain cigarettes.

Some interventions may be more effective at reducing tobacco access and use by younger smokers. For example, Tutt et al. ( 2000) (cross sectional study -) found that after three years of 90% retail compliance, smoking for youth aged 12-17 years decreased from 25.9% in 1993 to 22.7% in 1996, and to 17.1% in 1999. The greatest reduction could be found among persons who smoked 1 to 5 cigarettes a day (chi-square = 18.4, p = 0.182) and among younger smokers, including 12 year olds who went from 13.1% in 1993 to 9.0% in 1996, and 13 year olds who went from 19.7% to 13.3% over the same time period. The reductions in other age groups were less significant. Similarly, Glanz et al. ( 2007)(cross sectional, ++ ) found a significant

decrease in youth tobacco purchases between 1996 (44.5%) and 2003 (6.2%); older youth were more successful in purchasing tobacco than their younger counterparts (age 15: 0%, age 16: 4.7% and age 17: 9.2%). In a cross sectional US study (DiFranza, Celebucki, Mowery 2001) (+) found that merchants were more likely to sell tobacco products to older youth; violation rates varied from 4.2% for youth aged 13 years, to 30.5 % for youth aged 16 years. In a non-randomised controlled trial (+), Levinson and coworkers ( 2002) found that minors who were male or aged 17 had significantly increased odds of purchasing cigarettes ( $p < 0.001$ ).

The relative age of appearance may also influence their ability to access tobacco products. In trials carried out in 1999, Sundh and co-workers (+) ( 2004) found that 72% of the attempted purchases by adolescents with a younger appearance were successful, while adolescents with an older appearance were successful 92% of the time. Similarly, in a cross-sectional study (DiFranza, Savageau, Aisquith 1996) (+), researchers concluded that minors who appeared to be 16-17 years old were more successful in purchasing tobacco than minors who appeared to be 11-15 years old (odds ratio [OR] = 3.4, 95% CI = 2.0, 5.8) ( $P = .0001$ ).

Finally, despite minimum age laws, English survey data indicates that youth often succeed at buying cigarettes from shops. However, older youth appear to be more successful at purchasing cigarettes than younger youth. For example, 86% of 15 year olds successfully purchased tobacco. Meanwhile, 49% of 11-12 year olds were refused sales (compared to 14% of 15 year olds).

#### **Evidence Statement No. 25**

##### *Strength and applicability of evidence*

Access restrictions on the sale of tobacco have an impact on smokers in different ways, depending on their age and smoking status. Evidence from 1 (++)<sup>1</sup> Cochrane review and 1 cross sectional (++)<sup>2</sup> reveals that regular smokers encounter access restrictions on the sale of tobacco more frequently, but also employ more techniques to obtain cigarettes—such as presenting fake ID or lying about their age. One US-based cross sectional (–)<sup>3</sup> study found that retailer compliance resulted in the greatest decrease in smoking behaviour for younger and less experienced smokers. For example, the number of regular smokers decreased, the number of youth reporting at least monthly smoking decreased and the frequency of smoking decreased. Similarly, there is some US-based evidence from one (+)<sup>4</sup> cross sectional study and a (+)<sup>5</sup> non-randomised controlled trial study that older youth are more successful in purchasing tobacco. Some evidence also suggests that youth's age of appearance affects their ability to purchase tobacco. Two (+)<sup>6,7</sup> cross-sectional studies and survey data from England found that youth who appear older are more successful in purchasing tobacco than younger looking youth.

1. Stead et al., 2005
2. Glanz et al., 2007
3. Tutt et al., 2000
4. DiFranza et al., 2001
5. Levinson et al., 2002
6. Sundh et al., 2004
7. DiFranza et al., 1996

**Applicability:** Although all of these studies took place outside of the UK, it is likely that their findings are applicable to the UK, given the outcomes being measured.

### Sex

Various findings indicate that girls and boys differ in their ability to successfully purchase tobacco products. In a cross-sectional study (DiFranza, Savageau, Aisquith 1996) (+), the researchers concluded that girls had greater purchase success rates (OR = 4.49, 95% CI = 1.01, 2.19,  $P < .05$ ), even when apparent age was controlled in the regression analysis (OR = 1.59,  $p = .08$ ). Similarly, English data from the Smoking, Drinking and Drug Use Among Young People in England in 2006 survey found that girls (18%) were more likely than boys (15%) to have tried to purchase cigarettes from a shop. Yet girls and boys in this survey experienced similar refusal rates.

Other researchers have found that boys are more successful in buying tobacco than girls. In a Swedish cross sectional study (+), Sundh and co-workers (2004) concluded that after the introduction of a minimum age law in 1999, 65% of purchase attempts by girls with a younger appearance were successful. Before implementation, in 1996, 84% of purchase attempts by girls with a younger appearance were successful. For boys, 96% of purchase attempts in 1996 and 85% in 1999 were successful. Similarly, Glanz and colleagues (2007) (++) uncovered a significant decrease in the percent of successful tobacco purchases made over the period from 1996 (44.5%) to 2003 (6.2%), yet more sales occurred for males (9.3%) than females (4.5%).

The implementation of minimum age restrictions may impact girls and boys differently. In a cross sectional study (+), Sundh and colleagues (2005) analysed adolescent's (youth aged 13, 15 and 17) access to tobacco before and after the introduction of a minimum age law was compared. Findings revealed that the proportion of boys and girls in year 7 who said that they had bought tobacco during the previous month had decreased significantly ( $p < 0.0001$ ). For smokers, the proportion of girls who bought tobacco in shops decreased ( $p \leq 0.001$ ) in all age groups. Corresponding figures for boys who smoke show a statistically significant decrease only among year 9 students ( $p < 0.05$ ).

Girls and boys may differ in their likelihood of being asked for age and/or identification, and how this impacts tobacco sales. In a cross sectional study (+) investigating cashier compliance with minimum age requirements, girls and boys differed in the frequency with which they were asked their age or for ID (Landrine, Klonoff, Alcaraz 1996). Girls were asked for their ID in 4.4% and boys in 4.1% of their purchase attempts. When girls were asked for ID (vs. not asked) cigarette sales were highly unlikely ( $p = 0.002$ ). When girls were asked for ID they were sold cigarettes only 1.8% of the time, compared with being sold cigarettes 19.8% of the time when ID was not requested. When asked their age, girls were refused cigarettes 95.9% of the time ( $p = 0.00005$ ). In comparison, they were sold cigarettes 4.1% of the time when age was asked and 19.8% of the time when age was not asked.

**Evidence Statement No. 26***Strength and applicability of evidence*

Evidence from one US cross-sectional study (++)<sup>1</sup> found that males had greater purchasing success rates. English survey data indicates that girls try to purchase cigarettes more than boys however refusal rates, and therefore purchasing success rates, are similar. Evidence from two (+)<sup>2,3</sup> Swedish cross-sectional studies indicate that boys were more successful in purchasing tobacco, both before and after minimum age restrictions were applied. Conversely, one US (+)<sup>4</sup> cross sectional study suggests girls are more successful in buying tobacco and one (+)<sup>5</sup> cross sectional study found that girls were more frequently asked to present ID when attempting to buy cigarettes. Some evidence also suggests that requesting ID results in the greatest reduction of girl's access to purchasing cigarettes.

1. Glanz et al., 2007
2. Sundh et al., 2004
3. Sundh et al., 2005
4. DiFranza et al., 1996
5. Landrine et al., 1996

Applicability: All five studies took place outside of the UK. Furthermore, some evidence is not consistent with English survey data. Findings may not be directly relevant to the UK.

*Ethnicity*

Youth of different ethnicities may vary in their ability to purchase cigarettes. Landrine and colleagues (1996). (+) found that African-American children were sold cigarettes 3.2% of the time when age was requested, compared to 20.8% of the time when age was not requested (chi-square (1) = 9.56, P = 0.002). African American children were also significantly more likely than white children (5.3% vs. 3.1% of the time, chi-squared (1) = 4.65, p = 0.03), but not more likely than Latino children (4.4% of the time, chi-squared(1) = 1.72, p = 0.19) to be asked for ID. When African American children were asked for their ID, sales were refused 100% of the time (chi-squared(1) = 9.56, p=0.002, n=932 PAs), compared with being sold cigarettes 20.8% of the time when ID was not requested.

Lastly, tobacco policies may have varying impacts for different ethnic groups of young people. In a US-based cross-sectional study (working paper) (+) Chaloupka and Pacula (1999) examined differences in youth responsiveness to changes in tobacco policies. Using data from the national 1992-1994 Monitoring the Youth Surveys (students in their 8th, 10th and 12<sup>th</sup> year of school), they concluded that young white male's smoking rates are responsive to anti-tobacco activities and clean indoor restrictions, while smoking rates of young black males are influenced by smoking protection laws and youth access. Young white females are not affected by the existence of smoker protection laws or clean indoor air laws. Stricter youth access laws decrease smoking rates among young black females and males (p= 0.0799) while having very little effect on the smoking of white youth (P = 0.2557).

### Evidence Statement No. 27

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#### *Strength and applicability of evidence*

Evidence indicates that ethnicity influences the ability to buy tobacco among young people. One US (+)<sup>1</sup> cross-sectional study found that African American children, followed by Latino and White children respectively, were more likely to be asked for ID when attempting to purchase cigarettes. ID requests resulted in the greatest reduction of African American children's success in purchasing cigarettes. The authors do not indicate whether or not ID requests resulted in a reduction of purchasing success for Hispanic or White youths. One US-based (+)<sup>2</sup> cross sectional study found that tobacco policies impact youth differently. Evidence shows that smoking rates for white male youth are more responsive to anti-tobacco activities and clean indoor restrictions, while young black males are more influenced by smoking protection and youth access laws (i.e. purchasing restrictions).

1. Landrine et al., 1996
2. Chaloupka et al., 1998

Applicability: As these studies deal with specific populations in the USA, it is unclear how applicable these findings are to a UK setting.

#### **4.8 What are the facilitators and barriers to implementation?**

##### *Social Sources*

According to the review (++) by Lantz and colleagues (2000), one of the major barriers to the effective implementation of youth access restrictions is the ability to acquire tobacco through social sources, such as family, friends and strangers. Similarly, two other reviews (Fichtenberg, Glantz 2002)(+); (Backinger et al. 2003)(+) also indicate how social sources of cigarettes act as a barrier to the effective implementation of access laws. These authors explain that as youth find it harder to buy cigarettes from commercial sources, they may simply shift to other available sources. Levy and Friend (2002) (review, +) suggest that research should focus on non-retail sources of tobacco such as parents, older siblings, peers and black markets. The availability of tobacco from non-retail social sources may inhibit the effectiveness of interventions and policies aimed at reducing retail access.

Similarly, according to survey data from England, youth who smoke often get their cigarettes from social sources. For example, as highlighted by the National Statistics Smoking, Drinking and Drug Use among Young People in England in 2006 survey (2007), 57% of youth were given cigarettes from friends, siblings (12%) and parents (7%). In addition to being given cigarettes, youth often buy cigarettes from social sources. Many youth (35%) bought cigarettes from other people (27% friends or relatives; 17% "other" people) and vending machines (14%). Interestingly, girls and younger youth were more likely to be given cigarettes. Younger youth were also more likely to find or take cigarettes (National Statistics, 2007).

##### *Enforcement*

In a US-based cross-sectional study (+), Chaloupka and Grossman (1996) examined the effectiveness of various tobacco control policies, including: increased taxes, restrictions on smoking in public spaces and worksites, and limits on the availability of tobacco for youth. The authors note that limited enforcement of these policies impedes the reduction of youth smoking. In particular, they argue that age restrictions are not well enforced, and are ineffective unless coupled with educational programs, licensing, and fines.



**Evidence Statement No. 28***Strength and applicability of evidence*

Two key barriers to the implementation of access restrictions on purchasing tobacco were identified. Evidence from three (+)<sup>1,2,3</sup> reviews and one (++)<sup>4</sup> review indicates that access restrictions are impeded by a young person's ability to access tobacco products from social sources including friends, family, and strangers. UK Survey data reveals similar findings. Furthermore, evidence from one (+)<sup>5</sup> cross sectional study based in the USA shows that weak enforcement of laws and policies creates a barrier to the effective reduction of the number of youth smoking. In particular, minimum age restrictions are not well enforced.

1. Fichtenburg et al., 2002
2. Backinger et al., 2003
3. Levy et al., 2002
4. Lantz et al., 2000
5. Chaloupka et al., 1996

Applicability: Although the studies were conducted in the USA, their results are likely to be broadly applicable to the UK setting.

**4.9 How would differences between the comparators used in published studies and the prevailing situation in England impact on the analysis of effectiveness?**

Only one study identified by the literature examined the impact of interventions to prevent the illegal sale of tobacco to children and youth in the UK. As a result, it is not clear whether the results of the literature identified will be directly applicable to the UK. The majority of studies reviewed were based in the US where age restrictions and demographic characteristics (of both shop assistants and youth) may be different than the UK. However, similarities exist regarding how and where (i.e. including barriers such as social sources) youth access cigarettes. Furthermore, similarities exist regarding the need to create comprehensive interventions. Overall, this evidence suggests that some of the lessons learned elsewhere will apply to the UK. Yet, to determine the effectiveness of youth access restrictions in the UK, more UK specific research is needed.

**Evidence Statement No. 29***Strength and applicability of evidence*

It is not clear if the evidence reviewed is directly applicable to the UK. The majority of studies identified by the literature search were conducted in the USA. Many of these studies were outlining the results of specific regional or state interventions. However, similarities in how and where youth acquire cigarettes and the need to create comprehensive interventions, some findings may be applicable to the UK. Only one of the studies reviewed was conducted in the UK.

## Overview and Discussion

While there was evidence examining mass media and access interventions, there was a paucity of information and a lack of consistent data on some specific research questions. In terms of mass media interventions, there was a lack of consistent evidence examining whether interventions were delaying rather than preventing the onset of smoking, whether the status of the person delivering an intervention impacts on effectiveness, and whether effectiveness was dependent on a variety of demographic factors. Additionally, there was a lack of published literature examining new forms of media. As a result, emerging findings regarding new forms of media such as the internet and social networking sites were acquired from key informant interviews. Finally, in relation to access interventions, it is important to note that the studies examined the impact of interventions on sales rather than smoking behaviour or prevalence. One study did address the impact of access restrictions on smoking behaviours and found no relationship between merchant compliance and smoking prevalence. As a result, it is not clear what impact access restrictions are having on smoking behaviours. Broader limitations of the review will now be discussed.

### *Limitations*

As we have already highlighted, much of the research identified within this review was conducted in the USA. Although some broad similarities can be drawn between youth smoking and uptake in the US and UK, many of the studies identified referred to US specific campaigns, interventions or laws/restrictions. Furthermore, the demographics of participants in US studies differ to the demographics of English young people. As a result it is not clear whether all findings are directly applicable to the UK.

A second limitation of this review is that many of the studies identified used very similar study designs. Many of the studies identified by the literature search, particularly in relation to access interventions, were observational in nature. Only a few studies were experimental; the majority used a cross sectional research design. Many of these studies relied on recall or self report data. This resulted in many studies receiving a lower rating.

A third limitation of the study was the fact that individual studies from reviews, including the Cochrane Reviews, were not individually reviewed or rated. As a result, it is possible that some depth has been lost. However, It is also important to note that the Cochrane Reviews had different eligibility criteria and outcomes of interest.

### *Mass Media Interventions*

Overall, there is a body of RCT (++) and cross sectional (+) evidence indicating that mass media interventions delivered by the anti-tobacco movement are more effective than tobacco industry campaigns. Anti-tobacco campaigns are more effective at producing negative attitudes and beliefs towards smoking. However, it was not clear if either type of campaign influenced intentions to smoke.

It is not clear if interventions are delaying rather than preventing the uptake of smoking in children and youth.

There are a variety of factors that influence effectiveness based on the way that an intervention is delivered. Evidence from a variety of sources including RCT (++/+), cross sectional (+/-), review (+), and qualitative (+) studies highlight five intervention factors that influence effectiveness: message content, mode of delivery, target audience, message framing and message elements.

There is a lack of evidence outlining the impact of the person delivering mass media interventions. However, evidence from one review (+) and one cross sectional study (+) indicates that youth who receive anti-tobacco messages from a variety of sources are more likely to refuse tobacco.

There is strong evidence from a Cochrane Review (++) and three cross sectional studies (++) indicating that increased duration and exposure to mass media campaigns influences effectiveness. Increased exposure decreases intentions to smoke and increases negative attitudes towards the tobacco industry. These findings are supported by four cross sectional studies (+) and one cohort study (+). Four cross sectional studies (2 ++, 2 +) found that exposure to the TRUTH campaign over time decreased smoking and increased anti-tobacco beliefs and attitudes.

A variety of individual factors influence the effectiveness of mass media campaigns, however findings have not been consistent. According to one RCT (+), girls and boys are receptive to different mass media messages. In terms of effectiveness, while one cross sectional study (-) found that girls' behaviours are more responsive to anti-tobacco messages, one cross sectional study (+) found that no gender effects exist. Furthermore, one cohort study (+) found that boys are more susceptible than girls to smoking. Overall, it appears that gender differences may be dependent on message content – some messages elicit gender differences, others do not.

In terms of age, there is a body of evidence from two reviews (+), and three cross sectional studies (++, +, -) indicating that younger youth are more impacted by mass media campaigns than older youth. However, one cross sectional study (+) examining the impact of a web based intervention found that older youth demonstrated a greater change in behavioural intentions. Finally, there is some evidence from a RCT (+) and a cross sectional (+) indicating that message content has a differential impact on youth, based on their age.

Three studies have produced mixed results regarding the impact of ethnicity. While one cross sectional study (++) found that African American and Latino youth are more impacted by anti-tobacco messages than whites, one cross sectional study (+) found that there was no difference in reactions based on ethnicity. Furthermore, one cross sectional study (+) found that mass media campaigns had a greater impact on Latinos and Whites than African Americans.

Unfortunately, there was a lack of evidence specifically examining the impact of mass media campaigns on youth from different socio-economic backgrounds.

There is strong evidence from two reviews (++) indicating that the duration and exposure of mass media campaigns can act as either a barrier, or facilitator to overall effectiveness.

It is difficult to ascertain the applicability of evidence to the UK. The majority of studies reviewed were based in the US. However, important generic lessons can likely be transferred across continents. More research that is specific to the UK is needed to determine the effectiveness of mass media campaigns aimed at preventing the uptake of smoking in children and youth.

#### *Key Informant Interviews*

Key informants were asked questions regarding the effectiveness of mass media interventions to prevent the uptake of smoking in children and young people. They expressed diverse opinions about whether or not mass media interventions have been effective in preventing smoking in children and youth. Several felt that

interventions using mixed forms of media were most effective, while three informants contended that there is a lack of evidence supporting the relationship between mass media interventions and changes in, or prevention of, youth smoking. They also provided a variety of ideas about which interventions are most effective for preventing smoking in children and youth. Several people discussed the effectiveness of various modes of delivery, including: television, the internet, and new media formats. Some also mentioned the importance of collaborating with youth, and the potential for applying social and psychological theories when developing interventions. Overall, it was recognised that effective mass media interventions need to be part of broader tobacco control programmes.

All key informants agreed that there is a paucity of information regarding whether interventions are delaying rather than preventing the uptake of smoking. Several felt that campaigns can delay, but not prevent, smoking uptake in youth. Some participants mentioned a US-based example, yet none were aware of any successful UK-based interventions. They also expressed concerns with applying international evidence about mass media to a UK context. In particular, they discussed some of the significant social and cultural differences that create challenges when trying to apply international data. Yet, some informants insisted that there are valuable lessons to be learned from the successes of mass media campaigns in other countries.

While none of the informants specifically discussed how the person delivering an intervention influences its outcome, some people did discuss the importance of incorporating sources that are trusted by young people. Key informants contended that successful interventions should: be developed in collaboration with young people, address their knowledge and aspirations, and undergo continuous evaluation.

Overall, participants were unsure of how site/setting influences an intervention's effectiveness. Yet, several people discussed the importance of: the delivery format, the potential for using school based campaigns to target large numbers of youth, and the necessity of including culturally appropriate settings when designing interventions.

Informants were unsure of how the intensity of an intervention influences the effectiveness or duration of effect. Only one person responded in detail, arguing that it is important to develop interventions that are sustainable and comprehensive in scope.

Informants also discussed how the age, sex, ethnicity, or socioeconomic status of the young people being targeted should be considered when developing media interventions. In particular, participants were concerned with: how younger people are more influenced by campaigns, the accessibility and effectiveness of interventions for lower-income youth, and the importance of using messaging that are meaningful for different genders and ethnic groups. They also identified a variety of barriers to the successful application of mass media interventions. Overall, they discussed challenges such as: a lack of available funding, tailoring for diverse groups of youth, establishing consistent themes, creating sustainable interventions, and the challenge of continuously updating technologies.

#### *Access Restrictions*

When comparing interventions, there is weak evidence from a cross sectional study (-) indicating that tobacco industry prevention campaigns are not effective at reducing the illegal sale of tobacco to children and youth. When examining merchants who

took part in the tobacco industry's "It's the Law" campaign seven months after implementation, six of the seven participating merchants still sold cigarettes to youth.

There was a lack of information regarding whether access restrictions are delaying rather than preventing the uptake of smoking in youth. Nearly all of the studies identified by the literature search examined the effect of interventions on illegal sales (eg number of sales to youth, merchant compliance) rather than behaviour. One study did examine the impact of access restrictions on smoking behaviours and found no relationship between merchant compliance and smoking prevalence (Fichtenburg et al., 2002). As a result, it is not clear what impact access restrictions are having on smoking behaviours. However, evidence from a cross sectional study (+) indicates that youth who are in the earlier stages of smoking uptake rely more on social sources for cigarettes. Meanwhile youth in the higher stages of smoking uptake are affected more by restrictions but also more likely not to comply. As a result, youth in the early stages of smoking may not be impacted as much by access restrictions due to alternative sources of tobacco.

Although one review (+) found no differences in smoking rates in communities with and without access restrictions, there is a body of evidence indicating that the way an intervention is implemented impacts effectiveness. Findings from a review (++, +) and a cross sectional study (+) indicates that interventions that are multi-faceted are the most effective at reducing youth access to tobacco. Evidence (3 reviews ++/+/, and 2 cross sectional studies +/-) also indicates that active enforcement is a component of effective interventions. Finally, according to two cross sectional studies (+), one review (++) and one non-randomised controlled trial (+) study, requesting age or identification can also decrease the illegal sale of tobacco to youth.

There is some evidence that the effectiveness of access restrictions depends on the status of the person implementing them. For example, data from one non-randomised controlled trial (+) and two cross-sectional studies (+) indicates that the age, gender and ethnicity of store clerks influences the outcomes. Merchants who are younger and male may be more likely to sell tobacco to youth.

Evidence from two cross sectional studies (++/+) and English survey data indicates that the site/setting of an intervention influences effectiveness. Youth appear to be more successful purchasing tobacco from a variety of stores including convenience stores, tobacco shops and newsstands. Two cross sectional studies (+) also reveal that youth are more successful purchasing tobacco from unlocked vending machines or self service displays, as opposed to locked vending machines or over the counter stores. Furthermore, according to English survey data young people most often report purchasing cigarettes from newsagents, tobacconists or sweet shops as well as from vending machines.

Evidence from three cross sectional studies (two +, one -) examined the impact of interventions over time. Findings revealed that factors such as successive retail inspections, public prosecutions and awareness of restrictions decrease illegal sales of tobacco. Meanwhile, one review (+) indicates that access restrictions do not impact youth smoking behaviour. Similarly, another review (+) indicates that interventions may not produce sustained decreases in illegal sales.

A variety of demographic factors can influence the effectiveness of interventions aimed at reducing the illegal sale of tobacco to children. Several studies (two reviews ++; five cross sectional studies- four +, one -; one non-randomised controlled trial +) and English survey data have uniformly found that older more established smokers are more successful at purchasing tobacco. In terms of sex, one cross sectional (++)

study and one RCT (+) found that boys are more successful than girls at acquiring tobacco. Another study outlined that girls are more often asked for ID (cross sectional +). However, one cross sectional study (+) found that girls are more successful at buying tobacco. English survey data also indicates that girls are more likely than boys to have tried to purchase cigarettes from a shop. Finally, a young person's ethnicity appears to have an impact on their ability to buy tobacco. For example, one cross sectional study (+) found that African Americans have the greatest reduction in tobacco purchases due to access restrictions. Similarly, another cross sectional study (+) found that black males are more responsive to youth access restrictions while white males are more responsive to anti-tobacco activities and clear air restrictions.

Overall, the literature identified two key barriers to the effective implementation of access interventions. According to one review (++) and English survey data, youth access to tobacco through social sources is a key barrier to preventing the sale of tobacco to children and youth. Lack of enforcement was another barrier identified by a cross sectional study (+).

Finally, it is not clear whether the results of the literature identified will be directly applicable to the UK. The majority of studies reviewed were based in the US. However, English survey data indicates that similarities do exist between the current situation in the UK and the literature. This is particularly true regarding how and where youth access cigarettes. To further determine the effectiveness of youth access restrictions in the UK, more UK specific research is needed.

### *Conclusion*

Findings from this review suggest that when interventions are implemented in a comprehensive, multi-component manner, they can influence children and young people. As highlighted throughout the review, interventions may positively change the anti-tobacco attitudes, beliefs, intentions and behaviours of young people. However, a variety of factors can influence effectiveness including the way that an intervention is delivered, the person who is delivering the intervention, and the site/setting of the intervention. It is also important to note that not all interventions impact all young people in the same way. The effectiveness of both mass media and access restriction interventions can be affected by age, sex, and diversity. Finally, while there is a body of literature examining both mass media and access restriction interventions to prevent the uptake of smoking in children and youth, there is a lack of information (particularly UK based) regarding specific research questions. There is also limited evidence regarding the impact of access restrictions on smoking behaviours. As a result, it has not been possible to determine to what extent, the findings of this review are directly applicable to the UK.

## 5 Mass Media Evidence Table

Mass Media Evidence table						
First author	Study population	Research question	Intervention	Main results	Applicability to UK and populations settings	Confounders
Year	Inclusion/exclusion criteria. Number of participants (randomised to each group or otherwise).	Power calculation	Comparisons	Effect size CI		Comments
Country		Funding	Length of follow-up, follow-up rate			
Study design	Age; Sex; S/E status; Ethnicity; Pregnant; Other, e.g. inpatient, ....					
Quality						
Devlin et al. 2007 UK Qualitative- Focus Groups ++	N=18 friendship pairs (9 male, 9 female)  N=12 focus groups (6 male, 6 female)  Age 11-14  Sample was weighted towards lower SES groups	The purpose of this research was to explore young people's views, attitudes and behaviours towards smoking, and their response to different types of message appeal. It sought to examine the significance and meaning young people attach in order to provide insight into sub group differences.  Funded by Cancer Research UK.	A qualitative research design was used and a total of 12 focus groups and 18 friendship pairs were conducted in England with 11-14 year olds, half of whom were smokers and half of whom had experimented. Sampling was purposeful incorporating the following variables: gender, age, SES, and smoking status.	Findings demonstrate that no single anti-smoking message is likely to have universal appeal. Smokers' responses to different message appeals are to a large extent mediated by the values the individual attaches to smoking, with different types of young smokers attending to different message themes in different ways. All three message themes have some potential in young people (fear appeals, social norms, industry manipulation).	Conducted in the UK and is directly applicable.	A very well conducted study that used triangulation, discussed data analysis (thematic analysis, coding), and provided a rationale for the choice of method.

<p>Dunn et al. 2004 USA Cross Sectional +</p>	<p>N= 852 youth aged 15-17 years old were randomly selected from country specific sampling frames.</p> <p>Six rural and areas and two urban regions in Minnesota were selected for the survey.</p>	<p>The purpose of this study is to outline and discuss the methodology used to evaluate the youth organising component of the TM movement and report on its effectiveness with respect to primary outcome measures of activities designed to reach the target population of at risk youth.</p> <p>Funded by the Minnesota American Lung Association through the Minnesota Youth Prevention Initiative of the Minnesota Department of Health.</p>	<p>A phone survey was administered to teenagers to assess their associations between exposure to anti-industry youth organising activities and tobacco related attitudes and behaviours. A group level comparison between areas high and low in youth organising activities was planned.</p> <p>Exposure index scores were developed for 2 types of activities designed to get youth in the anti-industry tobacco program: branding and messaging. Attitudinal outcomes measured attitudes about the tobacco industry and the effectiveness of youth action. Behavioural outcomes included taking action to get involved in the organisation, spreading an anti-tobacco message and smoking susceptibility.</p>	<p>Branding index scores were significantly related to taking action to get involved (<math>p \leq .001</math>) and the spreading of an anti-industry message (<math>p \leq .001</math>). Furthermore, messaging index scores were significantly related to attitudinal constructs (all <math>ps \leq .001</math>), taking action to get involved (<math>p \leq .001</math>), and the spreading of an anti-industry message (<math>p \leq .01</math>). The relationships between messaging scores and branding activity and susceptibility were not statistically significant. The researchers concluded that organising efforts by youth, together with intensive counter marketing media campaigns, can be effective in preventing smoking among young people and creating negative attitudes towards the tobacco industry.</p>	<p>Study conducted in the USA. Responses to the survey were in response to USA specific media campaigns using anti-industry approaches. As a result, findings from this study are not likely relevant to the UK.</p>	<p>A well conducted study that controlled for confounders, and had a high response rate. However, there was a lack of information on missing data and it is not clear if the measurement method was reliable. There was also an increased risk of a Type I error and self selection of youth into exposure levels and types (as outlined by the authors).</p>
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<p>Edwards et al. 2004</p> <p>Australia</p> <p>Non-randomised controlled trial</p> <p>+</p>	<p>N= 2038 Females aged 12-17 attending a cinema in New South Wales Australia.</p>	<p>Evaluate the effect of an anti-smoking advertisement on young women's perceptions of smoking in movies and their intentions to smoke.</p> <p>Funded by the NSW Health Women's Health Strategy.</p>	<p>Patrons were surveyed after having viewed a movie at their local cinema. The control group was surveyed during week 1 and the intervention group, during week 2. Before seeing the movie in week 2, a 30 second anti-smoking advertisement was shown, which showed a well known female actress drawing attention to the prevalence of smoking in movies.</p>	<p>The researchers found that among non-smokers, 48.2% of the intervention subjects disapproved of smoking in movies, whereas 25.2% of the control subjects disapproved of smoking in movies (<math>\chi^2=83.11</math>, <math>df=3</math>, <math>p&lt;0.0001</math>). There was no overall significant effect of the intervention on intention to smoke (<math>\chi^2=3.26</math>, <math>df=2</math>, <math>p&lt;0.196</math>). There was a significant relation between intention to smoke and smoking status (<math>\chi^2=643.09</math>, <math>df=2</math>, <math>p&lt;0.0001</math>), with a lower percentage of smokers than non-smokers indicating they would be unlikely to smoke in 12 months. The study provides some support that showing an anti-smoking ad before a movie lowers intention to smoke in the future among smokers (but not non-smokers).</p>	<p>This study was conducted in Australia. It is not clear whether the results would be directly applicable to the UK. However the study could be easily repeated in the UK context.</p>	<p>A well conducted study that disaggregated by age and used multivariate analysis to control for differences between groups. However, there was no mention of whether the measurement method was valid and reliable.</p>
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<p>Emery et al. 2005 USA Cross Sectional +</p>	<p>N= 51,085 students N=19,043 8<sup>th</sup> graders N=16,131 10<sup>th</sup> graders N=15,911 12<sup>th</sup> graders</p> <p>Nationally representative sample.</p>	<p>Examine the relationships between American youths' tobacco related beliefs, attitudes and behaviours and their exposure to anti-tobacco ads while controlling for tobacco industry sponsored anti-tobacco ads and ads from pharmaceutical companies.</p> <p>Funded by the State and Community Tobacco Control Initiative of the National Cancer Institute, the National Institute on Drug Abuse and the Robert Wood Johnson Foundation.</p>	<p>Commercial ratings data on mean audience exposure to anti-tobacco ads that appeared on network and cable TV across the largest 75 media markets in the US for 1999-2000 were combined with nationally representative survey data from school based samples of youth in contiguous 48 states. Multivariate regression models were used to analyse associations between mean exposure to state anti-tobacco advertising and youth smoking related behaviours and beliefs.</p>	<p>Mean exposure to at least 1 state-sponsored anti-tobacco ad in the past 4 months was associated with lower perceived rates of friends smoking (OR=0.72, 95% CI=0.58-0.88, p&lt;0.01), greater perceived harm of smoking (OR 1.25; 95% CI, 1.11-1.42, p&lt;0.001) stronger intentions not to smoke in the future (OR, 1.43; 95% CI, 1.17-1.74, p&lt;0.001) and lower odds of being a smoker (OR, 0.74; 95% CI, 0.63-0.88, p&lt;0.01)</p>	<p>Study conducted in the USA. Responses to the survey were in response to USA specific media campaigns. As a result, findings from this study are not likely relevant to the UK.</p>	<p>A well conducted study that dealt with missing data, response rates and confounders. However, it would have been beneficial to have more information on the reliability and validity of the measurement methods.</p>
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<p>Farrelly et al. 2005 USA Cross Sectional ++</p>	<p>N= Approx. 50,000 students in grade 8, 10, and 12 (random sample). Surveyed each spring from 1997-2002.</p>	<p>Study the impact of the TRUTH campaign on national smoking rates among US youth (students in grade 8, 10, and 12).</p> <p>Assess whether there is a dose response relationship between the level of exposure to the campaign and youth smoking prevalence during the first 2 years of the campaign.</p> <p>Funded by the American Legacy Foundation</p>	<p>Used data from Monitoring the Future survey in pre/post quasi-experimental design to relate trends in youth smoking prevalence to varied doses of the "TRUTH" campaign</p>	<p>Smoking prevalence among all students declined from 25.3% to 18.0% between 1999 and 2002. The campaign accounted for approx. 22% (95% CI=8.2%, 35.6%) of this decline.</p> <p>8<sup>th</sup> grade students exhibited the largest declines during this period 45%. Average annual percentage change 1997-1999= -3.4; 95%CI=-4.6, -2.1. Average annual percentage change 2000-2002=-9.0; 95%CI=-10.4-7.6. Grade 12 students showed the smallest decline 27%. Average annual percentage change 1997-1999= -1.8, 95%CI=-2.7,-1.0. Average annual percentage change 2000-2002=-5.1, 95% CI= -6.1, -3.9.</p> <p>For all grades there was a statistically significant dose-response relationship between the "truth" campaign exposure and current youth smoking prevalence (OR=0.78; CI=0.63, 0.97; p&lt;.05).</p>	<p>Conducted in the US in response to a particular US based campaign (Truth). Results may not be directly applicable to the UK due to the nature of the campaign.</p>	<p>A well conducted study that controlled for confounders (pulled out effects of campaign from other possible effects) and used both pre and post intervention data (multiple points before and after).</p>
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<p>Farrelly et al. 2002 USA Cross Sectional +</p>	<p>N= 3439 12-17 year olds (survey 1) N= 6233 12-17 year olds (survey 2)  Response rates: 52.5% (survey 1) 52.3% (survey 2)  Enhanced representation of African Americans, Asians and Hispanics.</p>	<p>Examine how the American Legacy Foundation's "Truth" campaign and Phillip Morris's "Think. Don't Smoke" campaign have influenced youth attitudes, beliefs and intentions towards tobacco.  Funder not mentioned.</p>	<p>Analysed two phone surveys of 12-17 year olds with multivariate logistic regressions: A baseline survey conducted before the launch of "Truth" and a second survey 10 months into the "Truth campaign."</p>	<p>Between surveys the percentage of youth aged 12-17 who agreed with several attitudes and beliefs associated with the "Truth" campaign changed by an amount that ranged from 6.6% to 26.4% for 'not looking cool' and 'efforts to eliminate smoking', respectively. Youth exposed to "truth" were more likely to agree that cigarette companies try to get young people to smoke (OR=1.29, P&lt;.097). Furthermore, a significant dose response effect was seen with increased exposure to "truth" (OR=1.2; P&lt;.005).  Exposure to "truth" was associated with doubling of the odds that youth would agree that cigarette companies lie (OR=1.97; P&lt;.001) and increase in exposure to additional ads were associated with concomitant increases in the odds of agreeing with this statement (OR=1.28 per additional ad; P&lt;.001).  The more "truth" ads seen the greater the odds of wanting to take a stand against smoking (P&lt;.01). Exposure to "Think. Don't smoke" was associated with an increase in the odds of youth intending to smoke in the next year (P&lt;.05) and a dose-</p>	<p>Conducted in the US in response to a particular US based campaign's (Truth&amp; Philip Morris). Results may not be directly applicable to the UK due to the nature of the campaign.</p>	<p>A well conducted study however, there was a low response rate, and a lack of information on missing data and eligibility.</p>
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				response relationship was statistically more robust ( $P < .02$ ).		
Friend et al. 2002 USA Review +	N=Unclear how many papers were reviewed	Examine reductions in smoking prevalence and cigarette consumption associated with state and local mass media campaigns.  Funded by the Substance Abuse and Mental Health Services Administration.	Studies for the review were identified using various internet searches. To combine the results of the studies a qualitative review was conducted. Literature on the associations between campaigns, both state and local and smoking prevalence was reviewed.	The literature suggests that well funded and implemented mass media campaigns targeted at the general population and implemented at the state level in conjunction with comprehensive tobacco control programs are associated with reduced smoking rates. Youth-oriented interventions have shown more mixed results, particularly smaller, community level media programs, but indicate strong potential.  From the review of literature the role of an ad's content, meaning or theme portrayed is unclear. The impact of a particular type of message is likely to depend on the demographic characteristics or the target population, as well as the extent of support for tobacco control activities in the jurisdiction in which the campaign is being implemented.  It is noted that other tobacco control policies may be a source of differences	The analysis was primarily limited to studies conducted in the US. Therefore results may not be directly applicable to the UK.	A well conducted review however studies were limited to the US. Furthermore, it is not a Cochrane review which is the benchmark for evidence-based medicine and reviews.

				in the effect of media campaigns (narrative synthesis).		
Grandpre et al. 2003 USA RCT +	N=612 students N=205 grade 4 N=257 grade 7 N=151 grade 10  Students attended 22 different schools  Anti-explicit condition=152 Anti-implicit condition=156 Pro-explicit condition= 153 Pro-implicit condition=154	Examines the impact of pro and anti smoking messages on a variety of outcomes including participants intended behaviors, evaluation of message sources, and seeking of disconfirming information.  Funded by: Arizona Disease Control and Research Commission.	All messages were created and delivered to 4 <sup>th</sup> , 7 <sup>th</sup> , 10 <sup>th</sup> grade students via a personal computer.  Computer randomly assigned youth to the conditions (Anti-explicit condition, Anti-implicit condition, Pro-explicit condition, Pro-implicit condition)  After viewing the messages participants answered a series of questions.	Analysis of video evaluation resulted in a significant main effect for grade in the students evaluation of the video (F[2, 609]= 4.144, p=0.016, n <sup>2</sup> = 0.013). Students in the seventh grade provided the most positive evaluations of the video (M = 2.70), whereas students in the tenth grade (M = 2.93) and students in the fourth grade (M = 3.00) provided more negative evaluations of the video. In contrast, to students in the fourth grade (M = 2.51) and students in the seventh grade (M = 2.52), students in the tenth grade (M = 2.85) were more likely to report that they felt they were free to make their own decision.  The researchers found a significant quadratic trend across grades, (F[2, 912] = 7.02, p = .001). For all message types and positions, students in the fourth grade had the most negative views of the source (M = 2.92), followed by students in the seventh grade (M = 2.64) and students in the	Study conducted in the USA. However, the study could be easily repeated in the UK. Results are likely relevant.	A well conducted study that pilot tested the intervention, randomly assigned subjects by computer and assessed the reliability of the measurement tool. However, it was not clear if results were similar across sites or if the groups were similar

				<p>tenth grade (M = 2.60) a significant main effect for grade was found for source evaluation (F[2, 606]=5.901, p=0.003, n<sup>2</sup>=0.020). T</p> <p>There was a significant main effect for overall intent to smoke found between the three grade levels (F[2, 599]=58.81, p&lt;0.001, n<sup>2</sup>= 0.164). Students in the fourth grade indicated the least intent to smoke (M = 1.22), followed by students in the seven grade (M = 1.57) and students in the tenth grade (M= 2.39). On the basis of these findings, the investigators concluded that grade level and message type have a significant effect on the processing of tobacco-related messages.</p> <p>There was a significant main effect for message type (F[1, 613]=21.079, p&lt;0.001). Based on a 5-point Likert scale (1= very good; 5=very bad), implicit messages resulted in a more positive source evaluation (mean = 2.66) than explicit messages (mean = 3.06). Students had a more negative evaluation of the source of pro-smoking messages than the source of anti-smoking messages, regardless of type of message.</p>		
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<p>Hafstad et al. 1996 Sweden Cross Sectional +</p>	<p>N=3670 youth aged 15 and 16 (1747 boys and 1923 girls)  Response rate (after two reminders)= 73%</p>	<p>Describe the results of a survey designed to measure the short term effects of the second out of three consecutive mass media campaigns. Although the main purpose of the campaign was to prevent the onset of smoking among girls in particular, its secondary goal was to prevent the onset of smoking among boys.  Supported by the Norwegian Women's Public Health Association.</p>	<p>The mass media campaign included both printed and electronic material and the evaluation survey was performed 14 days after the first campaign period. A questionnaire was mailed to the home address of the study population (all adolescents aged 15-16) in one county in Norway.</p>	<p>The authors concluded that smokers had stronger affective reactions towards the campaign than non-smokers (<math>p &lt; .0001</math>). A positive affective reaction was the most important predictor of positive behavioural outcomes. Among smokers, having discussed the campaign with another individual was also a predictor of positive behavioural outcomes (<math>p = .003</math>).</p>	<p>Study was conducted in Norway and was based on a mass media campaign specific to Norway (using print and electronic material). Findings may not be directly relevant to the UK.</p>	<p>A well conducted study that addressed missing data. However there was a lack of information on whether the measurement method was valid or reliable. Additionally, more information on eligibility was needed.</p>
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<p>Henriksen et al. 2006 USA Cluster RCT ++</p>	<p>N= 832 A convenience sample of 9<sup>th</sup> and 10<sup>th</sup> graders in a large public high school in California</p>	<p>Examine whether adolescents exposure to youth smoking prevention ads sponsored by tobacco companies promotes intentions to smoke, curiosity about smoking, and positive attitudes toward the tobacco industry.</p> <p>Funded by the California Tobacco Related Disease Research Program.</p>	<p>A randomized controlled experiment compared adolescents responses to five smoking prevention ads sponsored by a tobacco company (Philip Morris or Lorillard), or to five smoking prevention ads sponsored by a non-profit organization (the American Legacy Foundation), or to five ads about preventing drunk driving.</p>	<p>Adolescents did not perceive the three anti smoking campaigns to be equally effective (<math>F_{2,26}=18.8, p&lt;0.001</math>). Philip Morris (95%CI=2.48m 2.42, 2.54) and Lorillard (95% CI=2.50, 2.44, 2.56) ads were perceived to be less effective than the "truth" ads (<math>p&lt;0.001</math>).</p> <p>Although intention to smoke was slightly greater among students who saw ads sponsored by "truth" (M=1.8, SD=0.9), Lorillard (M=1.8, SD= 0.9) or Philip Morris (M=1.7, SD=0.9) than the control group (M=1.6, SD=0.7) these differences were not significant.</p> <p>Curiosity about smoking was slightly but not significantly higher among adolescents exposed to ads sponsored by "truth" (M=2.1, SD=0.9), Lorillard (M=2.2, SD=1.0), and Philip Morris (M=2.0, SD=0.8).</p> <p>Adolescents' sympathy towards tobacco companies differed as a result of ad exposure (<math>F_{3,34}=3.0, p&lt;0.05</math>). Adolescents exposed to Philip Morris (95%CI=2.26, 2.14, 2.38) and Lorillard (95% CI= 2.27, 2.16, 2.39) ads expressed greater sympathy for cigarette companies than the other experimental groups (<math>P&lt;0.006</math>).</p>	<p>Since it was conducted in one high school in California may not guarantee that the results are generalizable. Especially to the UK.</p>	<p>A well conducted study however there was a lack of information regarding whether the treatment and control groups were similar and whether there was any difference between groups. There was also a lack of information about those that gave consent differed from those who did not.</p>
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<p>Hersey et al. 2003 USA Cross Sectional +</p>	<p>N= 3198 youth aged 12-17. Enhanced representation of Hispanics, African Americans, Asians, and Latinos. Youth were from three states: California, Florida and Massachusetts.</p>	<p>Study sought to identify the pathway through which state-funded counter industry media campaigns influence beliefs and attitudes regarding tobacco industry practices and smoking status.  Funded by the American Legacy Foundation</p>	<p>A national random dial phone survey of youth was conducted in winter 1999-2000. Exploratory and confirmatory factor analysis investigated the structure underlying beliefs and attitudes towards the tobacco industry. Structural equation modelling tested whether the data were consistent with a theoretically based causal model of campaign effects from exposure to an aggressive counter-industry campaign, mediated by beliefs about tobacco industry practices and attitudes towards the tobacco industry, to smoking status.</p>	<p>Teens from counter industry states were significantly more likely to agree that smoke from others peoples cigarettes can be harmful (96.2% vs. 92.9%, OR=2.00, p&lt;0.05).  Teens from counter industry states held strong views towards the tobacco industry. Teens from counter industry states were significantly more likely to agree that cigarette companies lie (83.2% vs. 72.3%, OR= 1.57, p&lt;0.05), that cigarette companies try to get young people to smoke (83.6% vs. 71.2%, OR=1.58, p&lt;0.05) and that cigarette companies deny that cigarettes are addictive (72.2% vs. 53.8%, OR=2.22, p&lt;0.05).</p>	<p>Study conducted in the US in states with intensive tobacco control policies. Findings are not likely relevant to the UK.</p>	<p>A well conducted study that reported the reliability of measurement methods, and accounted for missing data. However, there was a lack of information on confounders. Participation rates were low.</p>
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<p>Hersey et al. 2005 USA Cross Sectional +</p>	<p>N=15,452 12-17 year olds Survey over sampled African American, Hispanics, Asians, Latinos and teens from states with active tobacco counter-marketing campaigns.</p>	<p>This study tested a theory-based model of the pathways by which exposure to the "truth" campaign influence beliefs, attitudes, and smoking behaviour.  Funded by the American Legacy Foundation.</p>	<p>Random digit phone surveys with 12-17 years olds were conducted 8 months and 15 months after the "truth" campaign launch.  Structural equation modelling was used to examine the direct, unmediated relationships between campaign awareness or exposure and smoking status. A two stage procedure was used to test the causal model of the effects of the truth campaign.</p>	<p>Youth in markets with higher levels of campaign exposure had more negative beliefs about tobacco industry practices (<math>\beta=-0.177</math>) and more negative attitudes toward the tobacco industry(<math>\beta=0.634</math>).  Results indicate that higher levels of cumulative exposure are associated with lower values on the smoking status continuum (<math>\beta=-.099</math>), consistent with the truth effect.  Exposure to truth was associated with negative beliefs about the tobacco industry practices. Individuals with higher levels of exposure to truth has less favourable industry beliefs (<math>\beta=0.177</math>).</p>	<p>Conducted in the US. Demographics of the study sample do not likely reflect that of the UK.</p>	<p>A well conducted study however there was a lack of information on the justification of participants. Participation rates were low.</p>
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<p>Hersey, Niederdeppe, Ng, et al. 2005 USA Cross Sectional +</p>	<p>N=3424 12-17 year olds Phase 1 N=12,967 12-17 year olds Phase 2 N= 10,855 12-17 year olds Phase 3 The surveys over sampled African Americans, Hispanics, Asians and Latinos.</p>	<p>Examines rates of decline in youth smoking between states with well funded counter-industry campaigns and other states. Funded by American Legacy Foundation.</p>	<p>Rates of youth smoking were compared in three groups of states: 1) those with long funded counter industry campaigns (California, Florida, Massachusetts) 2) states with more recently funded counter industry campaigns (Indiana, Minnesota, Mississippi, New Jersey) 3) other states. An analysis was performed for a series of national phone surveys of 12-17 year olds between 1999-2002, controlling for differences.</p>	<p>Between 1999-2002 rates of current and established smoking decreased significantly faster in states with established more newly funded counter-industry campaigns than in other states (<math>p &lt; 0.05</math>). Current smoking rates declined by 55% in established campaign states (from 12.3%-5.5%) and by 47% in newer campaign states (from 15%-7.9%). The rate of decrease in campaign states was roughly twice that of other states (52.6% vs. 24.9%); this difference was significant (<math>p &lt; 0.05</math>) after controlling for age, sex, race/ethnicity.  Over time, perceptions about the tobacco industry showed an increasingly stronger relationship with smoking status in campaign states. Within campaign states, youth with more negative perceptions of the tobacco industry had 14% lower odds of being current smokers in 1999 (OR=0.86). By 2002 their odds were 26% lower (OR=0.76).  Well funded counter industry campaigns can be an effective strategy to reduce youth smoking.</p>	<p>Conducted in the US. Campaigns are likely to be different than those in the UK.</p>	<p>A well conducted study that controlled for confounders. However, response rates were low and missing data was not accounted for.</p>
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<p>Johnston et al. 2005 USA Cross Sectional ++</p>	<p>N= 29,724 8<sup>th</sup> graders N=24,639 10<sup>th</sup> graders N=12,128 12<sup>th</sup> graders</p> <p>Response rates: 89% for 8<sup>th</sup> graders 86% for 10<sup>th</sup> graders 83% for 12<sup>th</sup> graders</p> <p>Nationally representative sample of students from 48 states.</p>	<p>Provide an overview of the national trends among youth in recall and appraisal of anti-smoking campaigns from 1997-2001.</p> <p>Funded by the Robert Wood Johnson Foundation, the National Institute on Drug Abuse, and the National Cancer Institute.</p>	<p>Data was obtained from the Monitoring the Future survey which was implemented from 1997-2001. Measures used in the analysis include exposure to anti-smoking media, appraisal of such media, student socio-demographics, smoking behaviours and reported media consumption.</p>	<p>There were significant differences between grades in student responses to whether the anti-smoking ads made them less likely to smoke. In 2001, 8<sup>th</sup> grade students were not only the most likely to say that the ads had had at least some impact in this area (58.7%) but also showed the strongest increase over the 5 years of data collection (starting at 44.2% in 1997, and ending at 58.7% in 2001, an increase of 14.5 percentage points. In contrast, 2001 levels were 44.9% for 10<sup>th</sup> graders, (a 10.0 percentage point increase from 1997) and 38.3% for 12 grade students (a 9.2 percentage point increase from 1997).</p> <p>Both African Americans (OR 1.8, p&lt;.001) and Hispanics (OR 1.2, p&lt;.01) reported being impacted by anti-smoking ads more than whites among 10<sup>th</sup> and 12<sup>th</sup> graders</p> <p>Any level of smoking decreased the odds of being affected by an anti-smoking media message compared to non-smokers; OR 0.3-0.5 for &lt; daily and OR 0.1-0.2 for daily smoking, p &lt;.001</p>	<p>Study was conducted in the USA. Mass Media campaigns under investigation were specific to the US- results are not likely directly applicable to the UK.</p>	<p>A well conducted study that addressed missing data, response rates, and confounders. They also talked about the reliability of the measurement methods.</p>
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<p>Kim 2006 South Korea RCT +</p>	<p>N=142 non smoking male students (mean age 16)  Data collected from five classes in a high school.</p>	<p>Examine the role of regulatory focus in the effectiveness of message framing in anti-tobacco ads for adolescents. Research evaluates the persuasiveness of message frames and offers recommendations on the implementation of antismoking ads, including strategies about possible target audiences.  Funder not mentioned.</p>	<p>All participants were randomly assigned to the condition of a 2 (goal priming: promotion versus prevention) x 2 (message frame: promotion framed versus prevention framed) between subjects design.  After watching messages participants completed a questionnaire.</p>	<p>The findings reveal that adolescents demonstrate 1) lower intentions to smoke 2) lower perceived pharmacological benefits of smoking and 3) lower perceived psychological benefits of smoking when the fit between regulatory goal and the antismoking message frame is congruent (versus incongruent).  Using a 7-point scale (1=definite no; 7 = definite yes), Kim found lower intentions to smoke, lower perceived pharmacological benefits of smoking, and lower perceived psychological benefits of smoking among youth when the regulatory goal and antismoking message frame were congruent. For intention to smoke, the promotion-primed condition participants exposed to the promotion-framed message (mean 2.34, SD 1.35) had lower intentions to smoke than those exposed to a prevention-framed message (mean 3.04, SD 1.34) and those in the control group mean 3.32, SD 1.85) <math>t(171) = -2.73, p=0.007</math>. In the prevention-primed condition participants exposed to the prevention-framed message (mean 2.48, SD 1.30) had lower intentions to smoke than those exposed to a promotion framed message (mean 3.34, SD 1.35) and those in the control group (3.32, SD</p>	<p>Conducted in South Korea. Results are not likely relevant to the UK.</p>	<p>A well conducted study however there was a lack of information on the control group.</p>
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				<p>1.85) <math>t(171) = -2.91, p = 0.004</math>. On the basis of these findings, Kim concluded that anti-smoking messages for youth with a promotion focus must emphasize promotion-related merits of refraining from smoking. Similarly, anti-smoking messages with a prevention focus should emphasize prevention-related merits of refraining from smoking.</p>		
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<p>Murray et al. 1994 USA Cross Sectional ++</p>	<p>N=36,000 grade 9 students in Minnesota and Wisconsin</p>	<p>Evaluate the Minnesota legislatures long term program to deter adolescent tobacco use (taxes, mass media, school programs etc.) by comparing Minnesota to Wisconsin (which had no legislation)</p> <p>Examine data on exposure to anti-tobacco messages in the mass media to examine beliefs about the health consequences of tobacco.</p> <p>Funded by the National Cancer Institute.</p>	<p>Annually from 1986-1990, 43-46 sampling units, closely approximating schools were randomly selected to represent Minnesota and Wisconsin. Survey teams visited each school and conducted the survey and an expired air test for CO<sub>2</sub>.</p>	<p>Results indicate that the Minnesota initiative dramatically increased Minnesota's school children's exposure to mass media but had little effect on smoking related beliefs or smoking behaviours.</p> <p>While there was a 2.4% net decline in Minnesota's smoking prevalence compared with Wisconsin from 1986-1990, that net decline was not significant (F=1.17, df=4,448; P=0.3238), although Minnesota had a lower average prevalence of smoking than Wisconsin over the five year study period (12.6% vs. 16.1%; F=28.80; df=1,438; P&lt;0.0001).</p>	<p>Conducted in the US. This study examines a very intensive, well funded, legislation intervention that is specific to the US. Findings may not be directly relevant to the UK.</p>	<p>A well conducted study that used bio-chemical validation, discussed reliability and had high response rates. Would have liked more information on confounders, missing data and eligibility.</p>
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<p>Niederdeppe 2005 USA Cross Sectional +</p>	<p>N=3409 12-15 year olds N=4171 16-18 year olds</p> <p>52.6% were male, 68.8% were white, 13% were African American, 13.5% were Hispanic and 4.2% were other.</p> <p>Response rate was 69%</p>	<p>Explore the relationship between specific stylistic features (intense images, sound saturation, acted out and second half punch) and message processing in youth in the context of a state wide anti-tobacco campaign.</p> <p>Funder not mentioned</p>	<p>Study began with a content analysis of ads that were included in at least one of the FAME surveys. Specific ads were coded for perceived message sensation value enhancing features, merging these codes to a telephone survey among teens, and testing the relationship between message features and processing.</p>	<p>There were no specific associations between message features and processing among teens. Among older teens, the number of unrelated cuts (OR=1.03, p&lt;0.001) and the use of suspenseful features (OR= 1.21, p&lt;0.001) increased the odds of processing.</p> <p>Unrelated cuts, intense images, and second half punch were significantly associated with increased message processing in younger teens (OR= 1.11, p&lt;0.01). The effect was considerably larger among older teens (OR= 1.25, p&lt;0.001).</p>	<p>Conducted in the US. Due to the nature of the study, findings may be relevant to the UK.</p>	<p>A well conducted study however the not sure that a phone survey was the best method to get the desired information.</p>
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<p>Niederdeppe et al. 2004 USA Cross Sectional +</p>	<p>N= 1097 teens aged 12-17 in Florida  N=6381 teens aged 12-17 from other states</p>	<p>Examine and compare Florida and national teens smoking intentions and behaviours based on their exposure to the "truth" campaign.  Funded by the American Legacy Foundation.</p>	<p>A random digit dial survey (LMTS) was designed to gauge the effectiveness of the "truth" campaign. Representative samples were drawn from states with existing counter-marketing campaigns to examine potential synergies with the "truth" campaign. Compared Florida and national teens smoking intentions and behaviours and contrast levels of program awareness. Also compared level of agreement with 4 beliefs about cigarette companies and 8 beliefs about social and physical effects of smoking.</p>	<p>Florida teens were less likely than their national counterparts to have smoked in the past 30 days to have ever tried smoking (Florida 6.6% vs. National 14%) , or to indicate that they could not rule out the possibility of smoking in the future (24.3% vs. 33.5%) (p&lt;.01). Florida teens reported less favourable beliefs than youth nationwide about the tobacco industry (13.8% vs. 24.3%) (p&lt;.05) but similar beliefs about the social and physical effects of smoking. (P value not reported)</p>	<p>Conducted in the US in response to a particular US based campaign (Truth). Results may not be directly applicable to the UK due to the nature of the campaign.</p>	<p>A well conducted study however there was a lack of information on confounders.</p>
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<p>Parlove et al 2004 USA Qualitative-focus groups +</p>	<p>N=27 students in the 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade 3 focus groups</p>	<p>The purpose of this study was to determine the acceptability of the web as a delivery medium for a smoking prevention intervention for middle school students. The study also attempted to identify design elements for inclusion in a web-based smoking prevention intervention that are appealing to adolescents.</p> <p>Funder not mentioned.</p>	<p>During the 45 minute discussion participants were asked to describe and explain their views and feelings about preference of delivery medium for smoking information. Students were given an opportunity to view an existing web-based smoking prevention intervention and asked to provide feedback.</p>	<p>Several students mentioned obtaining smoking information from the internet. However, there was a general distrust of the information as compared to information gathered from teachers or parents.</p> <p>Students preferred receiving smoking information from parents, teachers or friends.</p> <p>Participants indicated that they would go to the internet for information on smoking since it was easy to use and offered a wealth of information. Students liked the interactive and interpersonal aspects of the internet.</p> <p>Participants indicated the importance of having websites that had music, noise, colours, real pictures and features.</p>	<p>Ethnic background of participants does not reflect that of the UK. All participants were white.</p>	<p>No mention of triangulation, the role of the researcher of the rationale for a qualitative method. However, lots of quotes were provided.</p>
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<p>Pechmann 2006 USA RCT ++</p>	<p>N= 1725 9<sup>th</sup> grade students in California</p>	<p>Examine the effectiveness of 8 types of anti smoking ads representing health, counter-industry, and industry approaches.  Funded by the California Tobacco Related Disease Research Program</p>	<p>9<sup>th</sup> grade students were randomly assigned to view one of 9 videotapes containing a TV show with ads that included either a set of antismoking ads or a set of control ads. Participants completed baseline measures assessing personality, traits and post exposure measures assessing smoking intent, feelings, beliefs and ad evaluations.</p>	<p>Using a 5 point scale, the researchers found that ads focusing on youth victims suffering from serious tobacco-related disease elicited disgust, enhanced anti-industry motivation (mean 3.74; SE 0.09, p&lt;0.05), and reduced intent to smoke (mean 1.34; SE0.07, p&lt;0.01).</p>	<p>Due to the ethnicity of participants this findings are not likely applicable to the UK.</p>	<p>A well conducted study that used a control and comparison group, used the individual as the unit of analysis and was conducted in more than one location.</p>
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<p>Pechmann et al 2003 USA RCT ++</p>	<p>N= 1667 students (46% male) N=788 7<sup>th</sup> graders N=870 10<sup>th</sup> graders</p>	<p>Study used protection motivational theory to examine the likely impact of seven common anti-smoking message themes on the cognitions that they attempt to influence, namely health and social risk severity and self efficacy at refusing cigarette offers and resisting tobacco marketing.</p> <p>Funded by California Tobacco Related Disease Research Program</p>	<p>Randomly assigned participants to each condition. Each treatment condition consisted of 8 ads selected randomly from among the set identified in an ad coding study. The control condition consisted of 8 randomly selected ads from the Ad Council on the health and social risks of drunk driving.</p>	<p>Severity of health risk was scored from 0 – 9, with higher scores indicating a perception of higher severity. Among all subjects 4 message themes enhanced health risk severity perceptions compared to controls: disease and death (mean 7.68) (p&lt;0.05), endangers others (mean 7.91) (p&lt;0.01), and selling death (mean 8.15) (p&lt;0.01).</p> <p>Intentions not to smoke were bolstered by endangers others (mean 4.22) (p&lt;0.01), smokers negative life circumstances (mean 4.13) (p&lt;0.01) and refusal skills role model (mean 4.03) (p&lt;0.05).</p> <p>None of the message themes affected self-efficacy at refusing cigarette offers, self-efficacy at resisting tobacco marketing or health risk vulnerability.</p>	<p>Study was conducted in US. California has extensive smoking policies and tobacco control efforts.</p>	<p>A well conducted study that provided lots of theoretical background.</p>
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<p>Pechmann et al. 2002 USA RCT ++</p>	<p>N=? 9<sup>th</sup> graders from 4 California high schools</p> <p>52% were female, 70% were 14 years old, 53% were white, 27% Hispanic, 12% were Asian and 8% were other.</p>	<p>Determine if cigarette ads might function as primes and favourably bias adolescents' perceptions of peers who smoke.</p> <p>Funded by California Tobacco-Related Disease Research Programme.</p>	<p>Participants were randomly selected to see one of 8 slice of life video tapes showing stimulus advertising (cigarette, antismoking, both, neither) and unfamiliar peers who either did or did not smoke cigarettes.</p>	<p>Advertising and peer smoking interactively affected the stereotypic beliefs about a smoker (<math>p &lt; 0.05</math>). There was also a main effect for the advertising on stereotypic beliefs (<math>p &lt; 0.01</math>) but no main effect for peer smoking <math>p &lt; 0.25</math>.</p> <p>Findings revealed that subjects who saw peers smoking revealed that cigarette ads (vs. control ads not consisting of anti-smoking or cigarette ads) weakened their negative stereotypic beliefs (<math>t(710) = 3.62</math>, <math>p &lt; 0.01</math>) and increased their intention to smoke (<math>t(710) = 2.00</math>, <math>p &lt; 0.01</math>). When subjects saw peers who were not smoking, cigarette (vs. control) ads had no impact on stereotypic beliefs or intentions (<math>p</math>'s <math>&gt; 0.40</math>). The anti-smoking (vs. control) ads did not significantly impact on beliefs or intentions, regardless of whether shown with smokers or nonsmoker's (<math>p</math>'s <math>&gt; 0.10</math>).</p>	<p>Study was conducted in the US. Demographics of participants are not likely to reflect those of the UK.</p>	<p>A well conducted study that concealed the nature of the study from participants (added dummy questions to the survey so participants would not know what study was about). However, it is not clear if the results are consistent across sites or if there were any differences between groups.</p>
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<p>Popham et al. 1994 USA Cross Sectional +</p>	<p>N=29,264 students in grades 4-12</p>	<p>Examine and report the results of the California Department of health Services' tobacco education media campaign.  Funded by the California Dept. of Health Services.</p>	<p>Two major samples of Californian school age youth were evaluated through five indicators (tobacco use, campaign awareness, smokers intention to quit, non-smokers' intention to start smoking, attitudes regarding smoking), to evaluate the campaigns effectiveness.  Four waves of data gathering took place, one before the intervention and 3 at various intervals after the campaign started.</p>	<p>Over the course of the four campaign waves, the percentage of non-smokers thinking about starting to smoke decreased from 24.6% in wave 1 to 22.1% in wave 4 (<math>p &lt; 0.0025</math>). Over the course of the four campaign waves, the percentage of attitudes about smoking increased from 73% to 75.2% (<math>p &lt; 0.0025</math>). Finally, across the four waves, tobacco use decreased from 12.5% to 10.9% (<math>p &lt; 0.0025</math>).</p>	<p>Participants within this study specifically reflect the Californian school population. As a result, findings may not be directly applicable to the UK.</p>	<p>Would have liked more information on response rates and missing data. Additionally, there was a lack of information on the measurement method. Was it reliable? Study possibly used an invalid measure of non-smokers intentions to start smoking.</p>
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<p>Reinert et al. 2004 USA Cross Sectional +</p>	<p>N= 1151 students in grade 6-12 Representative sample in one south-eastern state</p>	<p>Examine the cumulative impact of anti-smoking messages from TV ads, communication with family, activities at sporting events or in the community and the internet, on tobacco attitudes and intentions of high school students in one rural southern state.</p> <p>Funded by the Partnership for a Healthy Mississippi.</p>	<p>Students participated in a structured interview (schools were randomly selects, grades were randomly selected and students were randomly selected). Data collection occurred after the implementation of a state wide extensive media campaign against tobacco.</p>	<p>Students who heard anti-tobacco messages from a variety of sources were less likely to use tobacco than students who heard anti-tobacco messages from fewer sources. Also, there was a small but statistically significant positive correlation between number of anti-tobacco sources and saying that even if one friend offered them a cigarette, participants would definitely not smoke (p&lt;0.001).</p>	<p>Findings of this study are not likely relevant to the UK since the ethnic background of the participants do not reflect the UK.</p>	<p>The study did not report information on the measurement method. No discussion of reliability and validity.</p>
<p>Schar et al. 2005 USA Review (narrative synthesis) +</p>	<p>N= it was not clear how many sources of data were evaluated.</p> <p>Data was included that covered awareness, recall, attitude evaluations and data on smoking prevalence and cigarette consumption.</p>	<p>Review existing campaign information provided by researchers and practitioners in tobacco control. Review focuses on findings from evaluations of TV ads used in paid mass media campaigns.</p>	<p>June 2001-2002 data was collected from tobacco control organizations. Additionally, published, unpublished and gray literature was collected.</p>	<p>Research from several countries indicates that counter marketing campaigns are successful when they are part of broader, comprehensive tobacco control activities.</p>	<p>This review is mainly focused on the US however literature review was international in scope. As a result, the findings are relevant to the UK.</p>	<p>A well conducted review that is international in scope. However, it is not a Cochrane Review which is the "gold" standard.</p>



<p>Seghers et al. 1998 USA Cross Sectional -</p>	<p>N= Approximately 500 students</p>	<p>The purpose of the paper is to summarize the activities of Kaiser Permanente and Group Health Northwest campaigns.  Funder not mentioned.</p>	<p>Surveys were conducted by health maintenance organization. Written questionnaires were given to 300 students and a telephone survey was conducted with 200 students before and after the campaign.</p>	<p>When asked about their intent to smoke quit smoking in the next 30 days "yes" responses from all participants increased from 37-56%. Participants under the age of 13 increased their "yes" responses from 18-50%.</p>	<p>Conducted in the US. Additionally, due to a lack of information it is hard to determine if these results would be applicable to the UK.</p>	<p>No information was provided on data analysis, or the measurement method. There was a general lack of information.</p>
<p>Shegog et al 2005 USA Cross Sectional +</p>	<p>N=2227 6<sup>th</sup> grade students  56.9% Hispanic, 24.5% African American, 7.9% white, 10.7% other.</p>	<p>Evaluate the use of a web based tobacco prevention program, "Headbutt," to change intentions in middle school children to smoke tobacco.  Funded by the National Institute for Health, National Cancer Institute</p>	<p>"Headbutt" was implemented with the use of a single group pre test-post test study design.</p>	<p>"Headbutt" significantly affected smoking intentions, pro-smoking attitudes, self-efficacy expectations, and knowledge of the negative consequences (all <math>p \leq 0.001</math>). Change in pro-smoking attitudes had the greatest predictive effect on smoking intentions (<math>p &lt; 0.001</math>).  Findings revealed that no gender effects were found. Both males and females were equally likely to change intentions as a result of using the Headbutt programme (<math>p = 0.893</math>).  Findings revealed that age was significantly associated with change in intention, with older students showing greater change in behavioural intentions than younger students (<math>p = 0.036</math>).  The researchers found that the</p>	<p>Study was conducted in the USA. Due to the ethnicity of participants findings are likely not relevant to the UK.</p>	<p>Well conducted. However, would have liked more information on the sampling method.</p>

				<p>programme had a greater impact on intentions to smoking among Hispanic and White students than Black students (<math>p = 0.001</math>). Notably, however, the Black students had the lowest intentions to smoke at both pretest and posttest.</p>		
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<p>Siegel et al 2000 USA Cohort +</p>	<p>N=592 Massachusetts youth age 12-15</p>	<p>Examined the impact of state wide antismoking media campaign on the progression to established smoking among Massachusetts adolescents.</p> <p>Funded by Robert Wood Johnson Foundation, Substance Abuse Policy Research Program and the Massachusetts Tobacco Control Program</p>	<p>Compared rates of progression to established smoking between groups on the basis of their reported baseline exposure to TV, radio and outdoor anti-smoking ads.</p>	<p>Among younger adolescents (age 12-13 at baseline) those reporting baseline exposure to TV ads were significantly less likely to progress to established smoking (OR=0.49, 95% CI=0.26, 0.93). Exposure to TV anti-smoking ads had no effect on progression to established smoking among older adolescents (age 14-15 at baseline) (OR = 0.94; 95% CI = 0.48, 1.83) and there were no effects to radio (OR = 0.86; 95% CI = 0.55, 1.37) or outdoor ads (OR = 0.85; 95% CI = 0.55, 1.31)</p>	<p>Results are not likely generalizable to the UK. The study looked specifically at the progression to smoking in that particular cohort.</p>	<p>A well conducted study that addressed confounders, selection into the study and mentioned the validity of exposure methods. However, no information was provided as to the reasons why participants did not provide consent. Distinction of whether participants were exposed was based only on recall.</p>
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<p>Sly et al. 2002 USA Cross Sectional ++</p>	<p>N=1,805 youth aged 12-20 who were non-smokers when first interviewed  49% female, 15% African American, 69% white, 21% single parent family, 17% attend private school</p>	<p>Assess the cumulative effects of exposure to multiple anti-tobacco ads shown over a 22 month period on smoking uptake and determine if there is a dose effect and how this effect operates through response to the campaign's major message theme and anti-tobacco attitudes.  Supported by contracts from the Office of Tobacco Control, Florida Dept. of Health.</p>	<p>A follow up survey was conducted after 22 months of the Florida "truth" campaign. Logistic regression analysis were used to estimate adjusted odds ratios for the likelihood that time one non-smokers would remain non-smokers at time 2 by levels of confirmed ad awareness, self reported influence of the campaigns message theme and anti tobacco industry manipulation attitudes. Separate cohorts were analyzed.</p>	<p>The odds of remaining non smokers increases as the number of ads confirmed, the self reported influence of the campaigns major message theme and the level of anti-tobacco attitudes increases. The observed effects were greater in established smokers than non-smokers. The pattern of these relationships holds within cohorts of younger and older youth. Considering all variables simultaneously suggest that ad confirmation operates through its effects on the influence of the message theme and anti-tobacco industry manipulation.  Findings also revealed that youth with low scores on the media effect index (measuring confirmed awareness, receptivity and cognitive or perceived influence) and those with high scores were 22% and 40.4%, respectively, were less likely to take up smoking than those not affected by the media campaign.</p>	<p>Conducted in the US in response to a particular US based campaign (Truth). Results may not be directly applicable to the UK due to the nature of the campaign.</p>	<p>Conducted a lot of analysis and sub analysis. Followed up with a sub sample of participants using the FSS survey one year afterwards.</p>
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<p>Sly et al. 2001 USA Cross Sectional ++</p>	<p>N= 12-17 year olds  N=1,800 in each of 2 Florida surveys; 1,000 in each of 2 parallel national surveys.</p>	<p>To outline the design and present selected findings from the evaluation of a state counter-advertising anti-tobacco media campaign.  Supported by contracts for the media evaluation component of the Florida tobacco pilot programme and the Florida Tobacco Control Programme, Florida Dept. of Health and the Tobacco Research and Evaluation Coordinating Centre.</p>	<p>Four cross sectional phone surveys were used to track &amp; monitor advertising and campaign awareness, confirmed awareness and receptivity. The Florida baseline and one year surveys were used with parallel national surveys to assess attitude and smoking related behaviour change attributed to the campaign.</p>	<p>Significant increases in ad specific awareness, confirmed, receptivity, and campaign awareness (40%) were reached by the 6<sup>th</sup> week. They continued to rise though the first year (70%). No attitude and only minor behaviour differences were noted between the treatment and comparison populations at baseline. Despite higher levels of awareness in Florida at baseline, the data suggest a campaign effect at 1 year Florida had higher levels of awareness (92% vs. 55%) and higher levels of confirmed awareness (89% vs. 30%). At 1 year, the declines in 'ever tired a cigarette', 'current user' and 'susceptibility' were greater in Florida (13% vs 4%, 8.9% vs -12%, 333% vs 1%, respectively), than nationally <math>p &lt; .05</math>.</p>	<p>Conducted in the US and is based on the Truth campaign. The truth campaign is unique in that it has received a lot of funding and focuses on exposing the tobacco industry. As a result, this campaign and its results may not be generalizable to the UK.</p>	<p>A well conducted study that compared results in Florida to those of other states (comparison group). The study also did many levels of analysis (including baseline) and conducted multiple surveys (longitudinal).</p>
<p>Sly, Hopkins et al. 2001 USA Cross Sectional +</p>	<p>N=1820 12-17 year olds.</p>	<p>Assess the short term effects of TV ads from the Florida "Truth" campaign on rates of smoking intention.  Supported by contracts from the Office of Tobacco Control, Florida Dept. of Health.</p>	<p>Youth were interviewed during the first 6 months of the ad campaign. Logistic regression analyses were used to estimate the independent effects of the campaign on smoking intention while other factors were controlled for.</p>	<p>Youth scoring at intermediate (OR 1.3, <math>p &lt; .05</math>) and high levels (OR 1.7, <math>p &lt; .05</math>) on a media effectiveness index were less likely to initiate smoking than youth who could not confirm awareness of the TV ads. Adjusted odds ratios of the impact of the media effectiveness index on smoking initiation were not modified by age, sex, susceptibility or parental smoking. Furthermore, those younger than 16 years of age had an initiation rate 24.3% lower than those older than 16. The estimated smoking initiation rate</p>	<p>Results may not be generalizable since the Florida campaign is unique in several respects: intense exposure, high levels of funding, and the campaign focuses on industry manipulation.</p>	<p>A well conducted study that discusses reliability. Additionally, data collection took place at two points. Lots of analysis was conducted.</p>

				per 100 was 11.1 per year.		
Smith et al. 2006 USA RCT +	N=565 students in junior high and high school  43% male, 58% in JH, 42% in HS.  70% white, 20% Hispanic, 5% African American, and 5% other.  79% high SES and 21% low	Test the effect of individual factors (grade level, gender, and ethnicity) on the effectiveness of two types of message content in anti-smoking ads.  Funded by a grant from the College of Business Administration, Texas State University.	Research was a field experiment which the smoking behaviour of groups exposed to anti-smoking ads were compared to that of groups who saw no ads. The study was a 3x (treatment: no ad (control), ST cosmetic content ads, or LT health content ads) x 2 (grade level: Junior high or high school) experimental design. All students completed a baseline and follow up questionnaire.	Youth who were exposed to anti-smoking ads were less likely to smoke ( $p < 0.01$ ), had lower intentions to start smoking ( $p < 0.01$ ), and had greater intentions to quit ( $p < 0.01$ ). However, the results of the study suggest that message types differ in their effect. For example, although cosmetic ads and health ads were similarly effective in making youth less likely to smoke (-0.2 for cosmetic and health), health ads were significantly more effective in lowering intentions to start smoking (0.04 for cosmetic vs. -0.38 for health) and increasing intentions to quit (-0.03 for cosmetic vs. -0.40 for health).  For males, health ads were found to have a greater impact on smoking behaviour (-0.18 for health vs. 0.04 for cosmetics) ( $p < 0.05$ ) and intentions to quit (-0.92 for health vs. 0.03 for cosmetic) ( $p < 0.01$ ). For females, cosmetic ads were found to have a greater impact on smoking behaviour (-0.07 for cosmetic vs. 0.11 for health) ( $p < 0.05$ ) and intentions to quit (-0.10 for cosmetic vs. 0.05 for health) ( $p < 0.01$ ). Notably, for both males and females, health ads were found to be more effective in reducing intentions to start smoking (males: -0.58 for health vs. 0.05 for cosmetic, $p < 0.01$ ; females: -0.19 for health vs. 0.02 for cosmetic, $p < 0.01$ ).	Study was conducted in the USA. Ethnic background and SES are not likely reflective of the UK.	A well conducted study however it relied on self report measures of smoking. Furthermore, it was not clear if findings were comparable across sites.

<p>Sowden et al. 1998 UK Cochrane Review (narrative synthesis)  ++</p>	<p>N=63 studies  Inclusion: RCT's and time series studies that assessed the effectiveness of mass media campaigns in influencing the smoking behaviour of young people (under the age of 25).</p>	<p>1.) Examine the effectiveness of mass media campaigns, compared with no intervention in influencing the smoking behaviour of young people 2.) Examine the effectiveness of mass media campaigns combined with school-based programmes compared with no intervention in influencing the smoking behaviour of young people (NOT relevant to this review). 3.) Examine the effectiveness of mass media campaigns combined with school-based programmes compared with mass media campaigns alone in influencing the behaviour of young people (NOT relevant to this review).</p>	<p>Assess the effectiveness of mass media campaigns either as a single intervention or as part of a combined media and schools based approach in the prevention of the uptake of smoking in young people.</p>	<p>Six out of a total of 63 studies reporting info. On mass media smoking campaigns met all of the inclusion criteria. All 6 studies used a controlled trial design. Two studies concluded that the mass media were effective in influencing the smoking behaviour of young people. Both of the effected campaigns had a solid theoretical basis, used formative research in designing the campaign messages and message broadcast was of reasonable intensity over extensive periods of time.</p> <p>There is some evidence that the mass media can be effective in preventing the uptake of smoking in your people, but overall the evidence is not strong.</p>	<p>This is an international review of the evidence and its findings are therefore likely to be applicable to a UK setting</p>	<p>The Cochrane reviews represent the benchmark for evidence-based medicine and reviews are conducted to extremely high standards</p>
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		<p>4.) Examine the effectiveness of mass media campaigns combined with school-based programmes compared with schools-based programmes along in influencing the behaviour of young people (NOT relevant to this review).</p> <p>Sources of support:          NHS Research and Development          National Cancer Programme UK, NHS Centre for Reviews and Dissemination, UK.</p>				
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<p>Straub et al. 2003 USA Cross Sectional +</p>	<p>N=1229 9<sup>th</sup> graders at 7 public high schools  50% female, varied race,</p>	<p>To determine the effects of pro and anti tobacco ads on non-smoking adolescents intention to smoke in a single cohort.  Funded by the California Tobacco Related Disease Research Program.</p>	<p>Adolescents who identified as never having smoked even a puff of a cigarette completed a questionnaire that included questions on intention to smoke in the near future and tobacco advertising. Independent variables used to predict intention included exposure to, recognition of, and receptivity and attitudes towards pro tobacco and anti tobacco ads.</p>	<p>Those variables found to be significant predictors of intention to smoke included: (positive or increased intention) recognition of brand of favourite ad (p=0.01), willingness to use or wear tobacco branded products (p=0.0008), stress (p&lt;0.0001), and having friends who smoke (p=0.0018) and (negative, decreased intention) agreement with anti tobacco advertising (p&lt;0.0001) and having a live-in father who smokes (p=0.0065).</p>	<p>Conducted in California. California has extensive public anti tobacco campaigns and strict no smoking policies. The anti tobacco environment may not reflect that of the UK.</p>	<p>A well conducted study that used a baseline survey. Provided lots of information on the reliability of the measurement methods.</p>
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<p>Unger et al 2001 USA Cross Sectional +</p>	<p>N=5,870 8<sup>th</sup> grade students from California  Sample weighted to represent Californian youth.  33% white, 22% Hispanic, 15% Asian/Pacific Islander, 14% multi ethnic and 8% African American.  56% only spoke English at home.</p>	<p>Determine whether the various measures (receptivity to tobacco marketing, measures of affective responses, perceived pervasiveness of pro and anti tobacco marketing, and recall and recognition of specific ads) would cluster into meaningful factors and to determine whether these factors are associated with smoking status.  Supported by a contract from the California Dept. of Health Services, Tobacco Control Section and from funds from the California Tobacco Related Disease Research Program.</p>	<p>Evaluate various measures (receptivity to tobacco marketing, measures of affective responses, perceived pervasiveness of pro and anti tobacco marketing, and recall and recognition of specific ads) of pro and anti tobacco marketing exposure collected from an independent evaluation of California Tobacco Control Prevention and Education Program.</p>	<p>Perceived pervasiveness of anti tobacco marketing was highest among established smokers than among never smokers (<math>p &lt; 0.05</math>) and susceptibles (<math>p &lt; 0.0005</math>). It was lowest among susceptibles, significantly lower than never smokers (<math>p &lt; 0.05</math>), experimenters (<math>p &lt; 0.0005</math>) and established smokers (<math>p &lt; 0.0005</math>).  Recognition of specific anti tobacco ads was highest among established smokers and was significantly higher than never smokers (<math>p &lt; 0.05</math>) and susceptibles (<math>p &lt; 0.005</math>). Recognition of specific anti tobacco ads was lowest among susceptibles and was significantly lower than experimenters (<math>p &lt; 0.05</math>) and established smokers (<math>p &lt; 0.05</math>).</p>	<p>Conducted in California. California has extensive public anti tobacco campaigns and strict no smoking policies. The anti tobacco environment may not reflect that of the UK.</p>	<p>A well conducted study that mentioned the reliability of the measurement methods. However, would have liked more information on sampling methods and confounders.</p>
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Wakefield et al. 2006 USA Cross Sectional ++	N=103172 students in grade 8 (age 13), 10 (age 15), and 12 (age 17)  36% grade 8 64% in grade 10 and 12	To relate exposure to televised youth smoking prevention advertisements to youths' intentions, beliefs and behaviours.  Funded by the National Cancer Institute, the National Institute on Drug Abuse and the Robert Wood Johnson Foundation.	Commercial TV ratings data were obtained from 75 US media markets to determine youth exposure to tobacco company youth-targeted and parent targeted smoking prevention advertising. Data was merged with nationally representative school based survey data gathered from 1999-2002.	There was little relation between exposure to tobacco company-sponsored, youth-targeted advertising and youth smoking outcomes (recall of ads or smoking beliefs and behaviors). However, each additional ad viewed was associated with a 3% stronger intention to smoke in the future (OR=1.03, CI=1.01, 1.05). Among youth in grades 10 and 12, during the 4 months leading up to survey administration, each additional viewing of a tobacco company parent-targeted advertisement was, on average, associated with lower perceived harm of smoking (odds ratio [OR]=0.93; confidence interval [CI] = 0.88, 0.98), stronger approval of smoking (OR = 1.11; CI = 1.03,1.20), stronger intentions to smoke in the future (OR= 1.12; CI = 1.04,1.21), and greater likelihood of having smoked in the past 30 days (OR = 1.12; CI = 1.04,1.19).	This study was conducted in the US in relation to specific US based TV ads. Not clear if findings are directly applicable to the UK.	
Wakefield et al. 2005 USA Cross Sectional +	N= 278 8 <sup>th</sup> , 10 <sup>th</sup> , 12 <sup>th</sup> grade students  48.9% male, 75.9% white, 11.2% African American.  Confirmed non-smokers nor regular smokers	To determine how youth respond to anti-smoking ads that have been on the air in the US with a wide range of different themes, sponsors and target groups.  Funded by the State and Community Tobacco Control	Teens attended a viewing session where they watched 10 ads with 12-15 other youth over a 75 minute period. In total 50 ads were selected (representing a range of ad messages) from tobacco control programs, tobacco companies and pharmaceutical	There was no consistent significant relationship between response rating outcomes (eliciting negative emotions, interest levels etc) and respondent gender. Of 850 total models, 4.5% showed some level of significance. There was no consistent significant relationship between response rating outcomes and ethnicity of respondent as only 4.2% of models showed some significance. Smoking status and grade of respondent was significantly	Study conducted in the US. Ethnicity of participants does not reflect that of the UK. Ads that aired specifically in the US were reviewed in this study. As a result, findings are not likely generalizable to the UK.	The study did a good job of outlining the eligibility criteria. However, would have liked more information on reliability and validity.

		Initiative of the National Cancer Institute.	companies. Youth completed a response rating Likert scale for each ad.	related to response ratings in only 2.9% and 5.2% of comparisons respectively.  Based on structural equation modelling tobacco-industry ads (SD = -0.057(0.042), <i>ns</i> ) and pharmaceutical company ads (SD=-0.315(0.051), <i>p</i> <0.05) were rated as less cognitively engaging than were ads created by tobacco-control programs. Ads produced by the tobacco industry and the pharmaceutical industry also were rated as having significantly less negative emotional appeal than were ads produced by tobacco control programmes (SD=-0.43 (0.093), <i>p</i> <0.05 and -0.51(0.095), <i>p</i> <0.05, respectively).		
Wakefield et al. 2003 International Review (narrative synthesis) +	N= 8 studies	Present and discuss studies that are field experiments, evaluations of governments funded campaigns, those that examine the comparative effectiveness of diff. anti smoking themes and research pertaining to the relationship between anti-smoking ads and cigarette ads.  Funded by the Robert	Review empirical studies, encompassing community trials and field experiments and evaluates government funded anti-smoking ads, and qualitative studies that have examined the effects of anti-smoking ads on teens.	Anti-smoking ads appear to have more reliable positive effects on those in pre-adolescence or early adolescent by preventing commencement of smoking. It is unclear whether this is due to development differences or is a reflection of smoking experience or a combination of the two. In addition it is evident that social group interactions through family, peer and cultural contexts, can play an important role in reinforcing, denying or neutralizing potential effects of anti smoking ads. Although there are some evidence to suggest that advertising genres that graphically depict the health effects of smoking, emphasize social norms	The studies identified in this review are international. As a result, findings are likely relevant to the UK.	A well conducted review however it is not a Cochrane review which is the benchmark for evidence-based medicine and reviews.

		<p>Wood Johnson Foundation through the Tobacco Etiology Research Network and the State and Community Intervention Program of the National Cancer Institute.</p>		<p>against smoking and portray the tobacco industry as manipulative can positively impact teens, these findings are far from consistent. Finally the effects of anti-smoking ads on youth smoking can be enhanced by the use of other tobacco control strategies and may be dampened by tobacco ads and marketing.</p>		
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Weiss et al. 2006 USA Cohort +	N=2292 middle school students in the 6 <sup>th</sup> , 7 <sup>th</sup> and 8 <sup>th</sup> grade.	Examine the longitudinal impact of self-reported exposure to pro and anti tobacco media on adolescents' susceptibility to smoking using in school surveys from a culturally diverse sample.  Funded by National Institute of Health and the California Tobacco Related Disease Research Program.	Each student completed a 160 item survey. Measures included smoking susceptibility, pro-tobacco media exposure, acculturation, anti tobacco media and exposure.  Chi-square analyses were conducted to determine whether reported exposure to pro and anti tobacco media varied according to ethnicity, acculturation, and immigration status. 2 year follow up.	At baseline all 2,026 students were considered non-susceptible to smoking. A higher proportion of males (47.9%) relative to females (41.5%) were susceptible to smoking by year 3 (p<0.01). African Americans (53.3%), other ethnic groups (48.6%) and Latinos (47.8%) were more susceptible relative to whites (41.2%) and Asian Americans (39.1%) p<0.05).  Increased levels of pro tobacco media exposure at baseline was positively associated with susceptibility (OR 1.9 – 3.3, p<0.01), whereas increased levels of exposure to anti-tobacco media at baseline were associated with lower rates of smoking susceptibility (OR 0.74, p<0.05).	Conducted in California. California has extensive public anti tobacco campaigns and strict no smoking policies. The anti tobacco environment may not reflect that of the UK.	Study provided a good overview of eligibility of the participants and the number of participants per wave. There was a lack of information on effect size, missing data.
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<p>White et al 2003 Australia Cross Sectional +</p>	<p>N=400 14-17 year olds across Australia (1998)  N=3714 students aged 12-17 from the Australian state of Victoria.</p>	<p>To examine adolescents' awareness of and response to an adult focused anti-smoking advertising campaign.  Funded by the Commonwealth Department of Health and Ageing and the Cancer Council of Victoria.</p>	<p>Data was obtained from 2 cross sectional surveys. In both surveys youth answered questions on their awareness of the ad campaign and actions taken in response to the ad campaign. Youth in the national campaign also answered questions assessing knowledge of the health effects of smoking, impact of the campaign on adolescents and relevance of the campaign for youth and other groups.</p>	<p>54% (95% CI, 48%-60%) of nonsmokers and only 16% (95% CI, 9%-23%) of smokers thought that the adult focused campaign was relevant to them (<math>p&lt;0.01</math>).  Only 3/4's of smokers and non-smokers thought that the campaign has made smoking less desirable. Slightly more smokers (16%) than non-smokers (14%) thought that the campaign had made smoking more appealing to some teenagers; however the difference was not significant (difference 2%; 95% CI, 6%-10%).  The campaign generated quitting among current established smokers with 18% (95% CI, 14%-22%) saying they had tried to give up smoking, 27% (95% CI, 23%-31%) saying they had cut down the number of cigarettes they smoked and 26% (95% CI, 22%-30%) saying they had thought about quitting.</p>	<p>Conducted in Australia. Campaign was specific to Australia. Not clear whether results are directly applicable to the UK.</p>	<p>A well conducted study however there was no baseline data to show that the campaign directly influenced youth. Additionally, data from the two groups of youth (those surveyed over the phone vs. those surveyed at school) were collected at different times during the campaign.</p>
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<p>Zollinger et al 2006 USA Cross Sectional -</p>	<p>N=1,622 6<sup>th</sup> graders N=1,059 7<sup>th</sup> graders N=1,177 8<sup>th</sup> graders</p>	<p>Examine the awareness and impact of anti-tobacco media messages among rural, suburban, and urban youth.</p> <p>Funded by Indian State Dept. of Health and by Publicis Inc.</p>	<p>Self administered questionnaires were collected from youth to compare media awareness, and impact among groups.</p>	<p>Compared to rural youth suburban youth were more likely to recall media messages about the dangerous health effects of tobacco use (OR=1.94) and have their personal choice to use tobacco affected by the messages (OR=1.85). Suburban and urban youth more often recalled anti-tobacco messages (OR=2.0 and 2.15), reported that the message made them think about the dangers of tobacco use (OR=2.02 and 1.47), believed that these ads prevent youth from initiating tobacco use (OR=3.21 and 1.46) and stop youth from using tobacco (OR=2.25 and 1.47). Urban youth were more likely to recall specific campaign messages on the radio (OR=1.58). Neither suburban nor urban youth differed from rural youth on whether the campaign-specific radio and TV ads made them think about not using tobacco.</p> <p>The perceived impact of the anti-tobacco messages and specific media campaign messages was significantly higher for females (no p-value provided). Significantly more females than males recalled the anti-tobacco messages on TV (90.2% vs. 87.9%) and radio (68.1% vs. 58%).</p> <p>Students in grade 6 thought commercials would prevent children from initiating tobacco use (68.2%.</p>	<p>Conducted in the US. Demographics, geography, media messages and campaigns are specific to the US. As a result, findings may not be relevant to the UK.</p>	<p>There was a lack of information on survey reliability and validity, sampling method, and eligibility.</p>
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				64.8% and 60.1%, P <.001) compared to the students in grade 7 or 8.		
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**6 Access Restriction Evidence Table**

Access Restrictions Evidence Table						
First author	Study population	Research question	Intervention	Main results	Applicability to UK and populations settings	Confounders
Year	Inclusion/exclusion criteria. Number of participants (randomised to each group or otherwise).	Power calculation	Comparisons	Effect size CI		Comments
Country		Funding	Length of follow-up, follow-up rate			
Study design	Age; Sex; S/E status; Ethnicity; Pregnant; Other, e.g. inpatient, ....					
Quality						
Backinger et al. 2003 USA Review (narrative synthesis) +	Data included smoking prevention studies published from January 1990 to May 2002 and conducted in the US. All identified smoking cessation studies for adolescents. Young adult data were limited to initiation and cessation studies.	To summarize the evidence on adolescent and young adult prevention and cessation, and provide future directions for research.  Funder not mentioned.	Data was collected from published literature. Pubmed, PsychInfo, ERIC and SCCI were search for young adults and adolescents.	Findings reveal that studies on youth access show that young people continue to obtain cigarettes from non-commercial sources (friends and family) and commercial sources (convenience stores).	Literature used in this review was restricted to studies conducted in the US. Results are not likely relevant to the UK.	Many of the results were not relevant to the research questions and outcomes of this review. Selected data have been used in the review.

Chaloupka et al. 1996 USA Cross Sectional +	N= nationally representative students in grade 8, 10 and 12.	Examines the effectiveness of several tobacco control policies in discouraging cigarette smoking among youth. Policies include limits on the availability of tobacco products to youth.  Funded by the Centres for Disease Control and the Robert Wood Johnson Foundation.	Data was collected from the 1992-1994 Monitoring the Future campaign surveys of grade 8, 10, 12 students. Limits on the availability of tobacco products to youth were measured by several variables including: state minimum legal purchase age, an indicator for youth living in states requiring signs to be posted reflecting minimum age laws, etc.	Limits on youth access to tobacco products appear to have little impact on youth cigarette smoking, likely due to weak enforcement of the laws.	This study was conducted in the US. Due the ethnicity of youth in the US, and the types of tobacco control policies present in the US, it is not clear that the findings would be directly applicable to the UK.	A well conducted study that disaggregated results based on gender and race. More information on confounders and missing data would have been useful.
Chaloupka et al. 1998 USA Cross Sectional +	N= 198359 nationally representative students in grade 8, 10 and 12.	Examine differences in youth responsiveness to changes in price or tobacco control policies.  Funded by the Centres for Disease Control and the Robert Wood Johnson Foundation.	Data was collected from the 1992-1994 Monitoring the Future campaign surveys of grade 8, 10, 12 students. Indexes examined gender, SES, race, cigarette consumption, etc.	Significant differences in youth's responsiveness to tobacco control initiatives by race. Smoking rates among white youth are significantly influenced by anti-tobacco activities and clean indoor air restrictions ( $p < .05$ , $p < .10$ , respectively), whereas smoking rates among black youth are not. Smoking rates among black youth are significantly influenced by smoker protection laws and restrictions on youth access ( $p < .10$ ), whereas smoking rates among whites are not.	This study was conducted in the US. Due the ethnicity of youth in the US, and the types of tobacco control policies present in the US, it is not clear that the findings would be directly applicable to the UK.	A well conducted study that disaggregated results based on gender and race. More information on confounders and missing data would have been useful.

<p>Difranza et al 2001 USA Cross Sectional +</p>	<p>N=2013 purchase attempts  N=959 1996 N=1054 1997</p>	<p>Evaluate merchant compliance with laws prohibiting the sale of tobacco to minors.  Funded by the Massachusetts Tobacco Control Program.</p>	<p>Stratified cluster sampling was used to select outlets from which youth aged 13-17 years attempted to purchase tobacco.</p>	<p>Crude violation rates were 35% in 1996 and 17% for 1997 (<math>p &lt; 0.001</math>).  Male clerks made more sales than female clerks (27% vs. 22%; <math>p &lt; 0.05</math>). Illegal sales were comparable for locked vending machines (19% of 47 attempts) and over the counter outlets (24% of 1075 attempts; <math>p &gt; 0.05</math>), but were more frequent in self service displays (37% of 75 attempts, <math>p = 0.01</math>) vs. over the counter) and unlocked vending machines (64% of 58 attempts <math>p &lt; 0.001</math> vs over the counter).  Sales occurred in 1.5% of the 1180 attempts when proof of age was requested, as compared with 64% of the 712 attempts when it was not (<math>p &lt; 0.001</math>). Sales occurred in 5% of 317 attempts when age was asked and in 30% of 1502 when it was not (<math>p &lt; 0.001</math>).</p>	<p>Study conducted in the USA. Due the types of tobacco control policies present in the US, it is not clear that the findings would be directly applicable to the UK.</p>	<p>A well conducted study that discussed eligibility, sampling method and reliability of results.  However, the study did not discuss reliability and validity of measurement methods and exposure and did not discuss confounders.</p>
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<p>DiFranza et al. 1996 USA Cross Sectional +</p>	<p>N=480 cigarette purchase attempts. All of the tobacco merchants were located in 8 suburban and small urban communities. The over the counter vendors included convenience stores, pharmacies, liquor stores, and gasoline stations. All of the vending machines were located in restaurants.</p> <p>One boy and one girl aged 12, 13, 14, 15, 16, &amp; 17 were recruited through acquaintances to attempt to purchase tobacco.</p>	<p>Evaluate the influence of age, gender, vending machine lockout devices and tobacco industry sponsored programmes ("It's the Law" programmes) on underage youths' ability to purchase tobacco.</p> <p>Funded by a grant from the Massachusetts Tobacco Control Programme.</p>	<p>12 young people made 480 attempts to purchase tobacco in Massachusetts from over the counter and vending machines with and without remote control lockout devices. Half the vendors were participating in "It's the Law" programmes.</p>	<p>Youth were successful in 33% of their purchase attempts. Of the six opportunities to sell 28% of the vendors never sold, 23% sold once, 16% sold twice, 9% sold three times, 13% sold four times, 6% sold five times, and 6% sold at every opportunity.</p> <p>Apparent age was a significant predictor of purchase success. Youth who appeared to be 16-17 years old were much more successful than youth who appeared to be 11-15 (OR=3.4, 95% CI= 2.0, 5.8, p=.0001). Girls had a greater purchase success rate (OR= 1.49, 95% CI=1.01, 2.19, p&lt;.05). This persisted as a trend when apparent age was controlled in regression analysis (OR=1.59, 95% CI=0.94, 2.7, p=.08). Boys (29%) and girls (28%) were equally likely to be asked for proof of age even though girls appeared older.</p> <p>Youth were much more successful purchasing from vending machines than from over the counter sources (OR= 3.0, 95% CI=1.9, 4.7, p=.0001). In communities with no requirements for lockout devices, illegal sales were far more likely from vending machines than from over the counter sources (OR=5.9, 95% CI=3.3, 10.3, p=000.1).</p>	<p>This study was conducted in the USA. "It's the Law" is a USA specific tobacco program. As a result, findings may not be applicable to the UK.</p>	<p>A well conducted study that took many steps to reduce bias. However, confounders were not accounted for and eligibility criteria were not outlined.</p>
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				It's the Law programmes were not associated with a significant reduction in illegal sales when vending machine and over the counter sources were considered together (OR= 0.87, 95% CI=0.57, 1.35, p=.5) or when they were considered separately.		
Difranza et al. 1992 USA Cross Sectional -	N=156 tobacco merchants in Massachusetts	Examine the efficacy of the Tobacco Institutes "It's the Law" program.  Funder not mentioned.	5 underage youth, both male and female made "sham" purchase attempts from merchants participating in "it's the law" campaign.	Only 4.5% of 156 merchants were participating in "It's the Law" program. 86% of merchants who were participating in the program were willing to illegally sell cigarettes to children, compared with 88% who were not participating.	This study was conducted in the USA. "It's the Law" is a USA specific tobacco program. As a result, findings may not be applicable to the UK.	There was a lack of information on sampling method, eligibility criteria, and the type of analysis conducted. No p-values were provided.

<p>Fichtenberg et al. 2002 USA Systematic review +</p>	<p>N= 9 studies  Inclusion criteria- studies must include compliance and prevalence data  Interventions ranged in intensity from simple enforcement of laws to merchant and community education, to education combined with active enforcement via compliance testing, warnings, fines and suspension of tobacco selling licences.</p>	<p>To determine the effectiveness of laws restricting youth access to cigarettes on prevalence of smoking among teens.  Funded by the National Cancer Institute.</p>	<p>Conducted a systematic review of studies that reported changes in smoking associated with the presence of restrictions on the ability of teens to purchase cigarettes.  Calculated the correlation between merchant compliance levels with your access laws and prevalence (30 day and regular) prevalence of youth smoking, and between changes in compliance and prevalence associated with youth access interventions.  Conducted a random effects meta-analysis to determine the change in youth prevalence associated with youth access interventions from studies that included control communities.</p>	<p>There was no statistically significant relationship between merchant compliance and 30-day (<math>r=.116</math>, <math>p=.486</math>) or regular (<math>r=.017</math>, <math>p=.926</math>) teen smoking prevalence.  There was no evidence that an increase in compliance with youth access restrictions was associated with a decrease in 30-day (<math>r=.294</math>, <math>p=.237</math>) or regular (<math>r=.274</math>, <math>p=.287</math>) prevalence. Although none of these correlations are statistically significant, their signs suggest a positive association between increased compliance and increase smoking prevalence.  There was no significant differences in youth smoking in communities with youth access interventions compared with control communities: the pooled estimate of the effect of intervention on 30-day prevalence was <math>-1.5\%</math> (95% CI <math>-6.0\%</math>, <math>+2.9\%</math>)</p>	<p>This review considered international literature. As a result, findings from this review are likely relevant to the UK.</p>	<p>A well conducted review. However it is not a Cochrane (which represents the benchmark for evidence-based medicine and reviews are conducted to extremely high standards).</p>
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<p>Glanz et al. 2007 USA Cross Sectional ++</p>	<p>N=across eight years the number of stores surveyed ranged from: 448 in 1998 209 in 2003</p>	<p>Study examines the findings of annual Synar inspections to assess compliance with federal and state legislation to limit minors' access to tobacco products in Hawaii. Study also reports on factors associated with selling tobacco to minors for the most recent year of inspections.</p> <p>Funded by Hawaii's Department of Health's Alcohol and Drug Abuse Division, Federal Substance Abuse Prevention and Treatment Block Grant and the Hawaii Tobacco Control Settlement Fund.</p>	<p>Annual random unannounced inspections were conducted by minors over an 8 year period (1996-2003). Stores were randomly selected from a list of stores that sell tobacco products in Hawaii.</p>	<p>There was a decrease in the percent of successful purchases made over the period from 1996 to 2003 (44.5% vs. 6.2%). Based on multivariate analysis only 2 variables were associated with whether a successful purchase attempt was made in 2003: whether the minors' age (OR = 0.030, 95% CI = .002, .426) or identification (OR = 0.001, 95% CI = .001, .020) was requested.</p>	<p>Study was conducted in the US. Synar inspections are specific to the USA (in response to federal and state legislation). Findings may not be directly applicable to the UK.</p>	<p>A very well conducted study that accounted for confounder, had a high participation rate, and dealt with missing data.</p>
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<p>Lantz et al. 2000 USA Review (narrative synthesis) +</p>	<p>N= not clear how many articles were reviewed (However there are 142 references in the reference list).</p>	<p>To provide a comprehensive review of interventions and policies aimed at reducing youth cigarette smoking in the US, including strategies that have undergone evaluation and emerging innovations that have not yet been accessed for efficiency.</p> <p>Funded from Mr. Ted Klein, president of Ted Klein and Co., a New York City public relations firm.</p>	<p>Medline literature searches, books, reports, electronic list servers, and interviews with tobacco control advocates.</p> <p>Intervention and policy approaches were categorised into seven categories (school based, community interventions, mass media/public education, advertising restrictions, youth access restrictions, taxes and direct restrictions on smoking).</p>	<p>Youth smoking prevention control efforts have had mixed results. However, this review suggests a number of prevention strategies that are promising, especially if conducted in a coordinated way to take advantage of potential synergies across interventions. Several types of strategies warrant additional attention and evaluation including aggressive media campaigns.</p>	<p>This review was specific to literature in the US (focusing on interventions which are specific to the US). As a result, it is not likely that the results will be highly relevant to the UK</p>	<p>A well conducted review however studies were limited to the US. Furthermore, it is not a Cochrane review which is the benchmark for evidence-based medicine and reviews.</p>
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<p>Landrine et al. 1996 USA Cross Sectional +</p>	<p>N=2,567 purchase attempts from 72 stores</p>	<p>Examined the role of asking age/ID in cigarette sales to minors and explored the possible demographic correlates of asking such questions.</p> <p>Funded by Cigarette and Tobacco Surtax Fund of the State of California through the University of Calif. Tobacco Related Disease Research Program.</p>	<p>36 minors, representing equal numbers of girls, boys, whites, blacks and Latinos and of 10, 14, and 16 year olds each attempted to purchase cigarettes once from each of the 72 stores. The frequency of asking the children their age and or for ID was analyzed along with the role of these questions in subsequent sales.</p>	<p>The data revealed that requesting age/ID was rare (occurring 17% of the time) despite the laws in California. If clerks asked children their age, sales were significantly less likely (<math>p=0.000005</math>). When age was asked, minors were refused cigarettes 95.8% of the time. Similarly, if clerks requested ID, sales were significantly less likely (<math>p=0.00004</math>). When ID was requested, minors were refused cigarettes 99% of the time. Requesting ID was more strongly associated with decreased sales than asking age.</p>	<p>Conducted in the US. Ethnicity and demographics of participants may not reflect that of the UK.</p>	<p>Good reliability and validity however the dates of study were not clear, confounders were not addressed and missing data was mentioned but not really accounted for.</p>
<p>Levinson et al. 2002 USA Non-randomised controlled trial +</p>	<p>N=1083 purchase attempts</p>	<p>To estimate the effect on cigarette sales rates when minor presented ID</p> <p>Funded by State Tobacco Education and Prevention Partnership, Colorado Dept. of Health and Environment</p>	<p>Controlled experiment in which minors attempting to purchase cigarettes either carried a valid ID (documenting that they were minors) or carried no ID and were instructed to show their ID or admit having no ID if the clerk requested proof of age.</p>	<p>When clerks requested ID, sales were more than 6 times as frequent if minors presented ID than if they did not (12.2% vs. 2.0%, RR = 6.2, <math>p&lt;0.0001</math>).</p>	<p>Conducted in the US. Findings may be relevant to the UK since this was a controlled experiment (easily replicable).</p>	<p>A well conducted study that adequately addressed concealment, treatment and control groups and comparison of results across sites.</p>

Levy et al. 2002 USA Review (narrative synthesis) +	N= 23 studies nationally representative sample	To review empirical studies of youth access policies to better understand the components of successful and unsuccessful interventions and their impact on youth smoking rates. The purpose of this review is to formulate future policies and create of a framework for additional research	Interventions: Included enforcement efforts to reduce access by minors at stores, vending machines and social sources.  The relationship between youth access policies and smoking rates is inconsistent.  The researchers also found that in many cases the intervention had short-term result.	The researchers found that a successful policy that reduces retail sales usually has a multi-component approach that includes severe enforcement and penalties, as well as community education and mobilization.	This review was not international. Studies that were included were specific to the US. Findings are not likely relevant to the UK.	A well conducted review that adequately addressed the significance of combining community, mobilization and enforcement to tackle smoking among youth
Price 1998 New Zealand Cross Sectional -	N=980 stores were visited for controlled purchase operations (CPO's) between 1996-1997	Reports on the initiative-increased enforcement of section 30(1) which prohibits the sale of tobacco products to persons under the age of 18.  Funder not mentioned.	Ministry of Health co-ordinated a programme of CPO's using under age volunteers to identify merchants illegally selling tobacco products to minors.	Between Sept 1996 and Jun 1997, 693 CPO's were conducted and 67 (9.7%) resulted in the sale of tobacco to minors. Between July and Dec 1997 a further 287 CPO's were conducted and 17 (5.9%) resulted in sales. Therefore a total of 980 CPO's were conducted with 84 (6.8) resulting in sales. Of the 49 merchants prosecuted to date (December 1997) 41 were convicted.	Study conducted in the New Zealand. Due to the country specific legislation, it is not clear that the findings are directly applicable to the UK.	No information on the type of analysis and no info on sampling frame. There was a general lack of information.

<p>Ross et al. 2006 USA Cross Sectional +</p>	<p>N=16, 558 youth in grades 9-12.</p>	<p>Examine the differential effects of cigarette prices, clean indoor air laws, youth access laws and other socio-economic factors on smoking uptake among US high school students. The study also examines whether those at the final stages of uptake are more price responsive than those at the beginning stage.</p> <p>Funder not mentioned.</p>	<p>Youth in grade 9-12 completed the “study of smoking and tobacco use among young people” survey. Questions examined actual smoking behaviour, risk of uptake among non-smokers, and numerous variables examining SES, ethnicity, gender and age.</p>	<p>Compliance with youth access laws reduced the probability of being in a higher stages of smoking uptake (<math>p &lt; 0.05</math>). The finding that the impact of compliance is larger for those who are in later stages supports the hypothesis that social sources of cigarettes are more important in the earlier stages of smoking uptake.</p>	<p>Study was conducted in the US. Demographics of participants are not likely to reflect those of the UK.</p>	<p>A well conducted study however, there was no baseline or comparison and no information on missing data (readers are told the data is missing but we are not told how this impacts the results).</p>
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<p>Stead et al. 2005</p> <p>UK</p> <p>Cochrane Review (narrative synthesis)</p> <p>++</p>	<p>N=34 studies (14=had data from a control group for at least one outcome)</p> <p>Review included controlled trials and uncontrolled studies with pre and post intervention assessment of interventions to change merchants' behaviour.</p>	<p>1.) Does the intervention with merchants, by education, active enforcement of laws, or combinations of strategies lead to decreased sales to minors? Is there evidence that any of the strategies is superior to the others?</p> <p>2.) Do reduced sales of tobacco to minors lead to a decrease in their self reported ease of access?</p> <p>3.) Do reduced sales of tobacco to minors reduce the prevalence of tobacco use?</p> <p>Sources of support: NHS Research and Development Programme UK, Department of Primary Health Care, University of Oxford UK</p>	<p>Assess the effects of interventions to reduce underage access to tobacco by deterring shopkeepers from making illegal sales.</p> <p>Interventions: The review considered education, law enforcement, community mobilization, or combinations of strategies that aimed to deter merchants from selling tobacco to minors.</p>	<p>Giving merchant's information was less effective in reducing illegal sales than active enforcement or multi-component educational strategies, or both. No strategy achieved complete, sustained compliance. In three controlled trials, there was little effect of intervention on youth perceptions of access or prevalence of smoking.</p>	<p>This is an international review of the evidence and its findings are therefore likely to be applicable to a UK setting</p>	<p>The Cochrane reviews represent the benchmark for evidence-based medicine and reviews are conducted to extremely high standards</p>
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<p>Sundh et al. 2006 Sweden Cross Sectional +</p>	<p>N= 3150 test purchases in three regions of Sweden.</p> <p>Purchase attempts were made in supermarkets, food stores, after-hours supermarkets, newsagents and gas stations.</p> <p>28 phone interviews with individuals in the tobacco prevention field (regional and local levels).</p>	<p>Study the possible changes in adolescents' opportunities for purchasing tobacco during the period 1996-2005. The study also investigated regional differences in adolescents' opportunities for purchasing tobacco, and elucidated the efforts by authorities to affect the compliance with the minimum age law of 17.</p> <p>Funded by the National Institute of Public Health in Sweden.</p>	<p>In 1996, 1999, 2002, and 2005, 3150 test purchases of tobacco were conducted in controlled forms by 48 adolescents in three regions of Sweden. In addition, 28 structured phone interviews were conducted with key people in tobacco prevention work.</p>	<p>In 1996, 84% of test purchases in shops with a voluntary age limit resulted in successful purchases. A significant decline was observed in 2005, 8 years after the minimum age tobacco law was introduced, with 48% of test purchases resulting in successful purchases (<math>p \leq .001</math>). Results showed differences between the three regions (<math>p</math>s ranging from <math>\leq .001</math> to <math>\leq .01</math>) in compliance and in activities connected with the minimum age tobacco law.</p>	<p>Study was conducted in Sweden where the national minimum age law is also 18 (same as UK). However, additional rates of compliance were associated with region specific ordinances.</p>	<p>This study was well conducted but lacked information on eligibility criteria, and missing data (i.e. why specific communities were not involved in the study). Interview data/results were also lacking (rich data was not provided, all responses were categorized into three categories).</p>
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<p>Sundh et al 2005 Sweden Cross Sectional +</p>	<p>N=20,130 (1996) N=21,492 (2000)  Youth were 13, 15 and 17 years old.</p>	<p>The purpose of this study was to increase understanding of the prerequisites for tobacco prevention. The situations before and after the introduction of a minimum age law were compared with respect to opportunities for adolescents to buy tobacco, and to attitudes towards the law.  Funded by the National Institute of Public Health in Sweden.</p>	<p>Data was collected in 1996 and 2000 with a questionnaire examining tobacco, alcohol, drugs, health, family finances etc. specific questions asked youth for their attitudes towards the minimum age law</p>	<p>Findings revealed that the proportion of boys and girls in year 7 who said that they had bought tobacco during the previous month had decreased significantly (<math>p &lt; 0.0001</math>) between 1996 and 2000, whereas the corresponding figures for older adolescents remained unchanged.  Restricting the analysis to smokers, the proportion of girls who bought tobacco in shops decreased (<math>p \leq 0.001</math>) in all ages groups. Corresponding figures for boys showed a statistically significant decrease only among year 9 students (<math>p &lt; 0.05</math>).</p>	<p>Study was conducted in Sweden. Not clear that the findings would be directly applicable to the UK since the minimum age laws and restrictions are examined are specific to Sweden.</p>	<p>A well conducted study that discussed the type of analysis conducted and eligibility. However, there was a lack of information on missing data, confounders and reliability.</p>
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<p>Sundh et al 2004 Sweden Cross Sectional +</p>	<p>N=1,500 purchase attempts N=750 purchase attempts made before the law N=750 after the law</p>	<p>Purpose of the study is to compare the possibility of adolescents purchasing tobacco before and after the introduction of a minimum age law of 18 years, and to examine the factors that characterize the situations in which adolescents may or may not purchase tobacco.</p> <p>Funded by the National Institute of Public Health in Sweden.</p>	<p>Under controlled conditions adolescents of varying ages carried out test purchases of tobacco</p>	<p>In 1996, 91% of purchase attempts were successful, whereas in 1999, 82% of purchase attempts were successful. Requests for age or ID substantially decreased the likelihood of successful purchase.</p>	<p>Study conducted in 3 very specific regions of Sweden. Findings are relevant to the specific area of the country where spot checks occurred. Furthermore, laws and restrictions are specific to Sweden. Not clear that the findings would be directly applicable to the UK.</p>	<p>A well conducted study that conducted a baseline survey. However, participants used to conduct test purchase attempts were legal (18 years old), and simply looked young. This could raise issues of reliability and validity.</p>
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<p>Tangirala et al. 2006 USA Cross Sectional +</p>	<p>N= 5096 retail outlets in the state of Indiana including 1367 (26.82%) chain stores, 3729 (73.18%) independently owned stores. A total of 326 primary tobacco outlets were also identified via a database.</p>	<p>Determine whether inspections are effective as a means of increasing merchant compliance in restricting sales to persons under the age of 18 years, especially among merchants who have violated the law in the past.</p> <p>This project is supported by the Master Tobacco Settlement fund through the Indiana Tobacco Prevention and Cessation Agency- administered through the Alcohol &amp; Tobacco Commission and the Indiana Prevention Resource Centre.</p>	<p>Secondary data analysis was performed on inspection date from 2001-2003. The investigative team identified tobacco retail outlets with more than one inspection within the last 19 month time frame.</p>	<p>The percentage of violations at Inspection 2 was significantly lower than the percentage of violations at Inspection 1 (25.9% vs. 32.3%, <math>p &lt; .05</math>), indicating that retail outlet inspections are associated with increased sales restrictions to youth.</p>	<p>Study conducted in the US. The study focused on the TRIP programme- a state government youth access programme specific to Indiana. Findings are not likely relevant to the UK.</p>	<p>Study was well conducted and outlined eligibility criteria. Study also does a good job of outlining limitations. However, it failed to account for confounders, and missing data.</p>
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<p>Tutt et al. 2000 Australia Cross Sectional -</p>	<p>N= 133 vendors (1994) N= 126 (1995) N=124 (1996) N= 44 (1996/97) N= 51 (1997/98) N=47 (1998/99) *Sample of merchants surveyed has been in decline as a result of store closures.  Merchants to be tested : all those located within a 3km radius of four high schools located across the research area plus the nearest main shopping centre.</p>	<p>Examine retail compliance with prohibition of sales to minors. Proportion of youth smoking was also examined.  Funder not mentioned.</p>	<p>Retail compliance with prohibition of sales to minors was monitored through a series of undercover compliance surveys between 1993-1999. Compliance rates were affected by a campaign aimed at increasing merchant awareness of their obligations under the new law and well publicised prosecutions.  Intervention: education and awareness of Public Health Act (prohibition of selling tobacco to minors). Active enforcement of law in 1995.</p>	<p>In 1996 seven successful prosecutions occurred across the study area, with most resulting in \$1000 penalties and extensive publicity. Since then only three merchants have been successfully prosecuted, 2 in 1997 and 1 in 1999.  Noncompliance in surveys dropped from 30.8% (1994) to 8.1% in May 1996.  The overall proportion of 12-17 year olds reporting at least monthly smoking dropped from 25.9% in 1993 to 22.7% in 1996, and to 17.1% in 1999.  Greatest reductions were in youth who smoked "less than 1 a day", or "1-5 a day" (chisquare=8.4, p=0.182).</p>	<p>This study was conducted in Australia. Findings may not be relevant to the UK since compliance was impacted by a campaign at increasing merchant compliance. Campaign was specific to Australia.</p>	<p>A well conducted study. Confounders mentioned but not accounted for. Study outlined eligibility criteria and response rates. However, changes in the types and intensity of the intervention likely changed compliance checks.</p>
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**APPENDIX A: Databases, Search Terms, and Processes****A. CDSR/DARE and CENTRAL via Cochrane Library 2007 issue 2**

Search Name: NICE smoking mass media and POS 25062007

Save Date: 2007-06-25 10:25:27

ID	Search
#1	MeSH descriptor Mass Media explode all trees
#2	MeSH descriptor Cellular Phone explode all trees
#3	MeSH descriptor Electronic Mail explode all trees
#4	MeSH descriptor Radio explode all trees
#5	MeSH descriptor Television explode all trees
#6	MeSH descriptor Telephone explode all trees
#7	MeSH descriptor Advertising explode all trees
#8	MeSH descriptor Hotlines explode all trees
#9	MeSH descriptor Information Dissemination explode all trees
#10	MeSH descriptor Persuasive Communication explode all trees
#11	MeSH descriptor Nonverbal Communication explode all trees
#12	MeSH descriptor Motion Pictures explode all trees
#13	MeSH descriptor Multimedia explode all trees
#14	MeSH descriptor Communications Media explode all trees
#15	MeSH descriptor Tape Recording explode all trees
#16	MeSH descriptor Serial Publications explode all trees
#17	MeSH descriptor Pamphlets explode all trees
#18	MeSH descriptor Internet explode all trees
#19	MeSH descriptor Telecommunications explode all trees
#20	(mass media):ti or (mass media):ab
#21	advert* near/3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or □dolesc or □dolesce or movies or media or newspaper* or journal* or magazine*)
#22	campaign* near/3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or □dolesc or □dolesce or movies or media or newspaper* or journal* or magazine*)
#23	program* near/3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or □dolesc or □dolesce or movies or media or newspaper* or journal* or magazine*)
#24	commercial* near/3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or □dolesc or □dolesce or movies or media or newspaper* or journal* or magazine*)
#25	advert* near/3 (dvd or dvds or video* or "motion picture*" or film or films or broadcast* or radio or televised or □dolescen)
#26	campaign* near/3 (dvd or dvds or video* or "motion picture*" or film or films or broadcast* or radio or televised or □dolescen)
#27	program* near/3 (dvd or dvds or video* or "motion picture*" or film or films or broadcast* or radio or televised or □dolescen)
#28	commercial* near/3 (dvd or dvds or video* or "motion picture*" or film or films or broadcast* or radio or televised or □dolescen)
#29	phone near/3 (counsel* or hotline* or "hot line*" or quitline* or "quit line*" or helpline* or "help line*" or adviceline* or "advice line*")
#30	telephone near/3 (counsel* or hotline* or "hot line*" or quitline* or "quit line*" or helpline* or "help line*" or adviceline* or "advice line*")
#31	mobile near/3 (counsel* or hotline* or "hot line*" or quitline* or "quit line*" or helpline* or "help line*" or adviceline* or "advice line*")

- #32 cellular near/3 (counsel\* or hotline\* or "hot line\*" or quitline\* or "quit line\*" or helpline\* or "help line\*" or adviceline\* or "advice line\*")
- #33 internet near/3 (advert\* or campaign\* or information or program\* or commercial\*)
- #34 web\* near/3 (advert\* or campaign\* or information or program\* or commercial\*)
- #35 "text messag\*" or texting or sms or "short messag\* service\*" or "instant messag\*" or videomessag\* or "video messag\*" or "multimedia messag\*"
- #36 "pod cast\*" or podcast\* or blog or blogs or blogging or blogosphere
- #37 digital near/3 (media or device\* or platform\* or technolog\*)
- #38 wireless near/3 (media or device\* or platform\* or technolog\*)
- #39 online near/3 (forum\* or communit\* or discussion\*)
- #40 digital near/3 (market\* or campaign\* or advert\* or commercial\*)
- #41 interactive near/3 (market\* or campaign\* or advert\* or commercial\*)
- #42 mobile near/3 (market\* or campaign\* or advert\* or commercial\*)
- #43 online near/3 (market\* or campaign\* or advert\* or commercial\*)
- #44 viral near/3 (market\* or campaign\* or advert\* or commercial\*)
- #45 buzz near/3 (market\* or campaign\* or advert\* or commercial\*)
- #46 ("open space technolog\*" or "social networking" or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\*):ti,ab,kw
- #47 (e-mail\* or email\* or "electronic mail\*" or "mailing list\*"):ti,ab,kw
- #48 "viral video" or "internet buzz" or "buzz device" or adverggame or adverggames or advergaming
- #49 (#1 OR #2 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 #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48)
- #50 MeSH descriptor Smoking explode all trees
- #51 (smoking or antismoking or anti-smoking):ti,ab,kw or (smoker or smokers):ti,ab,kw or (tobacco):ti,ab,kw
- #52 MeSH descriptor Tobacco explode all trees
- #53 MeSH descriptor Tobacco Use Disorder explode all trees
- #54 (cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine):ti,ab,kw
- #55 MeSH descriptor Tobacco, Smokeless explode all trees
- #56 (#50 OR #51 OR #52 OR #53 OR #54 OR #55)
- #57 (child):kw
- #58 MeSH descriptor Adolescent explode all trees
- #59 young near (person\* or people or adult\* or individual\*)
- #60 "under 18\*" or underage\* or "under eighteen\*"
- #61 (boy or boys or girl or girls)
- #62 (child\* or adolescent\* or kid or kids or youth\* or youngster\* or minor or minors or teen\* or juvenile\* or student\* or pupil or pupils)
- #63 (#57 OR #58 OR #59 OR #60 OR #61 OR #62)
- #64 (#49 AND #56 AND #63)
- #65 MeSH descriptor Commerce explode all trees
- #66 cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine
- #67 (#65 AND #66)
- #68 MeSH descriptor Tobacco Industry explode all trees
- #69 (#67 OR #68)
- #70 (sale or sales or sell or selling or sold or supply or supplies or supplied or supply\*) near/3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine)

- #71 (purchas\* or retail\*) near/3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine)
- #72 (buy or buys or buying or bought) near/3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine)
- #73 (vend or vends or vending) near/3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine)
- #74 (shop or shops or shopping or shopped) near/3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine)
- #75 (store or stores or supermarket\*) near/3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or "hand roll\*" or nicotine)
- #76 tobacconist\*
- #77 (#69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76)
- #78 (#77 AND #63 AND #56)
- #79 (#64 OR #78)

## B. MEDLINE

#	Search History	Results
1	exp child/	1186801
2	exp adolescent/	1181375
3	(young adj (person\$ or people or adult\$ or individual\$)).ti,ab.	41941
4	(under 18\$ or underage\$ or under eighteen\$).ti,ab.	1063
5	(boy or boys or girl or girls).ti,ab.	104601
6	(child\$ or adolescent\$ or kid or kids or youth\$ or youngster\$ or minor or minors or teen\$ or juvenile\$ or student\$ or pupil or pupils).ti,ab.	944545
7	1 or 2 or 3 or 4 or 5 or 6	2174785
8	exp smoking/	83178
9	(smoking or antismoking or anti-smoking).ti,ab.	85043
10	(smoker or smokers).ti,ab.	33801
11	tobacco/ or tobacco.ti,ab.	44372
12	"tobacco use disorder"/	4072
13	(cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	46426
14	tobacco, smokeless/	1861
15	8 or 9 or 10 or 11 or 12 or 13 or 14	163356
16	exp mass media/	30268
17	cellular phone/	884
18	Electronic mail/	727
19	radio/ or television/ or telephone/	16772
20	advertising/ or hotlines/	11399
21	information dissemination/	3962
22	persuasive communication/	1881
23	nonverbal communication/	2557

24	motion pictures/	5471
25	multimedia/	909
26	communications media/	272
27	exp tape recording/	11339
28	exp serial publications/	23973
29	pamphlets/	2278
30	internet/	23301
31	telecommunications/	2613
32	mass media.ti,ab.	1646
33	((advert\$ or campaign\$ or program\$ or □dolescent\$) adj3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\$ or journal\$ or magazine\$)).ti,ab.	2331
34	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (dvd or dvds or video\$ or motion picture\$ or film or films or broadcast\$ or radio or televised or □dolescen)).ti,ab.	1013
35	((phone or telephone or mobile or cellular) adj3 (counsel\$ or hotline\$ or hot line\$ or quitline\$ or quit line\$ or helpline\$ or help line\$ or adviceline\$ or advice line\$)).ti,ab.	674
36	((internet or web\$) adj3 (advert\$ or campaign\$ or information or program\$ or commercial\$)).ti,ab.	2331
37	(text messag\$ or texting or sms or short messag\$ service\$ or instant messag\$ or videomessag\$ or video messag\$ or multimedia messag\$).ti,ab.	1796
38	(e-mail\$ or email\$ or electronic mail\$ or mailing list\$).ti,ab.	3024
39	(pod cast\$ or podcast\$ or blog or blogs or blogging or blogosphere).ti,ab.	68
40	(digital adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	938
41	(wireless adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	230
42	(online adj3 (forum\$ or communit\$ or discussion\$)).ti,ab.	157
43	((digital or interactive or mobile or online or viral or buzz) adj3 (market\$ or campaign\$ or advert\$ or commercial\$)).ti,ab.	228
44	(open space technolog\$ or social networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\$).ti,ab.	91
45	(viral video or internet buzz or buzz device or adverggame or advergaming).ti,ab.	1
46	16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45	114076
47	7 and 15 and 46	1447

48	commerce/ and (cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	240
49	tobacco industry/	2203
50	48 or 49	2360
51	((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	548
52	((purchase\$ or retail\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	219
53	((buy or buys or buying or bought) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	73
54	((vend or vends or vending) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	37
55	((shop or shops or shopping or shopped) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	14
56	((store or stores or supermarket\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	60
57	tobacconist\$.ti,ab.	8
58	50 or 51 or 52 or 53 or 54 or 55 or 56 or 57	2833
59	7 and 58	971
60	((prevent\$ or regulat\$ or control\$ or restrict\$ or prohibit\$ or ban\$ or limit\$ or illegal or law or legislat\$ or policy or policies) adj3 (smoke or smoking or tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	9143
61	exp Smoking/pc [Prevention & Control]	10299
62	60 or 61	16731
63	7 and 62	5588
64	47 or 59 or 63	6441
65	limit 64 to (□dolesc language and yr="1990 – 2007")	4805
66	exp asia/ or exp □doles/ or exp south □dolesc/ or exp developing country/	461775
67	65 not 66	4341

**C. EMBASE**

#	Search History	Results
1	exp tobacco smoking/	10856
2	(smoking or antismoking or anti-smoking).ti,ab.	14548
3	(smoker or smokers).ti,ab.	6579
4	tobacco.ti,ab.	5867
5	(cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	10162
6	exp Smokeless Tobacco/	250
7	or/1-6	21542
8	mass media/	3720
9	exp Computer Mediated Communication/	1257
10	exp Electronic Communication/	2311
11	radio/ or television/ or television advertising/ or telephone systems/	4323
12	advertising/ or hot line services/	4305
13	exp Information Dissemination/	334
14	exp Persuasive Communication/	2370
15	exp Nonverbal Communication/	9018
16	exp Films/	2247
17	hypermedia/	440
18	Communications Media/	1219
19	exp Audiotapes/	239
20	Videotape Recorders/ or Videotapes/	1312
21	news media/ or newspapers/ or magazines/	2239
22	internet/	7296
23	Telecommunications Media/	743
24	mass media.ti,ab.	1848
25	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\$ or journal\$ or magazine\$)).ti,ab.	3211
26	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (dvd or dvds or video\$ or motion picture\$ or film or films or broadcast\$ or radio or televised or □dolescen)).ti,ab.	893
27	((phone or telephone or mobile or cellular) adj3 (counsel\$ or hotline\$ or hot line\$ or quitline\$ or quit line\$ or helpline\$ or help line\$ or adviceline\$ or advice line\$)).ti,ab.	393
28	((internet or web\$) adj3 (advert\$ or campaign\$ or information or program\$ or commercial\$)).ti,ab.	1040
29	(text messag\$ or texting or sms or short messag\$ service\$	448

	or instant messag\$ or videomessag\$ or video messag\$ or multimedia messag\$).ti,ab.	
30	(e-mail\$ or email\$ or electronic mail\$ or mailing list\$).ti,ab.	2130
31	(pod cast\$ or podcast\$ or blog or blogs or blogging or blogosphere).ti,ab.	43
32	(digital adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	282
33	(wireless adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	71
34	(online adj3 (forum\$ or communit\$ or discussion\$)).ti,ab.	424
35	((digital or interactive or mobile or online or viral or buzz) adj3 (market\$ or campaign\$ or advert\$ or commercial\$)).ti,ab.	182
36	(open space technolog\$ or social networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\$).ti,ab.	114
37	(viral video or internet buzz or buzz device or adverggame or advergaming).ti,ab.	2
38	or/8-37	42002
39	7 and 38	924
40	business/ and (cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	26
41	((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	133
42	((purchase\$ or retail\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	83
43	((buy or buys or buying or bought) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	22
44	((vend or vends or vending) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	7
45	((shop or shops or shopping or shopped) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	5
46	((store or stores or supermarket\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	31
47	tobacconist\$.ti,ab.	2
48	or/40-47	228
49	((prevent\$ or regulat\$ or control\$ or restrict\$ or prohibit\$ or ban\$ or limit\$ or illegal or law or legislat\$ or policy or policies) adj3 (smoke or smoking or tobacco or cigar\$ or bidi or bidis	2509

	or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	
50	developing countries/	1549
51	(adoles or asia or south adolesc).lo.	5791
52	50 or 51	7205
53	limit 39 to (100 childhood <birth to age 12 yrs> or 160 preschool age <age 2 to 5 yrs> or 180 school age <age 6 to 12 yrs> or 200 adolescence <age 13 to 17 yrs>)	328
54	limit 48 to (100 childhood <birth to age 12 yrs> or 160 preschool age <age 2 to 5 yrs> or 180 school age <age 6 to 12 yrs> or 200 adolescence <age 13 to 17 yrs>)	101
55	limit 49 to (100 childhood <birth to age 12 yrs> or 160 preschool age <age 2 to 5 yrs> or 180 school age <age 6 to 12 yrs> or 200 adolescence <age 13 to 17 yrs>)	858
56	53 or 54 or 55	1123
57	limit 56 to yr="1990 – 2007"	1027
58	57 not 52	1022
59	limit 58 to adolesc language	984

#### D. CINAHL

#	Search History	Results
1	exp Child/	141500
2	exp Adolescence/	84311
3	(young adj (person\$ or people or adult\$ or individual\$)).ti,ab.	5994
4	(under 18\$ or underage\$ or under eighteen\$).ti,ab.	212
5	(boy or boys or girl or girls).ti,ab.	7540
6	(child\$ or adolescent\$ or kid or kids or youth\$ or youngster\$ or minor or minors or teen\$ or juvenile\$ or student\$ or pupil or pupils).ti,ab.	134986
7	or/1-6	238212
8	exp Smoking/	13816
9	Passive Smoking/	1059
10	(smoking or antismoking or anti-smoking).ti,ab.	11749
11	(smoker or smokers).ti,ab.	3727
12	tobacco/ or tobacco.ti,ab.	4996
13	(cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	4111
14	Tobacco, Smokeless/	317
15	or/8-14	20334
16	Communications Media/	2446
17	Wireless Communications/	1239



18	Electronic Mail/	1706
19	radio/ or television/ or telephone/	8928
20	advertising/	2623
21	Nonverbal Communication/	692
22	Motion Pictures/	578
23	Multimedia/	673
24	Audiorecording/ or videorecording/	19771
25	Pamphlets/	1140
26	exp Serial Publications/	16830
27	Internet/	7477
28	Telecommunications/	823
29	mass media.ti,ab.	320
30	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\$ or journal\$ or magazine\$)).ti,ab.	731
31	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (dvd or dvds or video\$ or motion picture\$ or film or films or broadcast\$ or radio or televised or □dolescen)).ti,ab.	359
32	((phone or telephone or mobile or cellular) adj3 (counsel\$ or hotline\$ or hot line\$ or quitline\$ or quit line\$ or helpline\$ or help line\$ or adviceline\$ or advice line\$)).ti,ab.	293
33	((internet or web\$) adj3 (advert\$ or campaign\$ or information or program\$ or commercial\$)).ti,ab.	1208
34	(text messag\$ or texting or sms or short messag\$ service\$ or instant messag\$ or videomessag\$ or video messag\$ or multimedia messag\$).ti,ab.	94
35	(e-mail\$ or email\$ or electronic mail\$ or mailing list\$).ti,ab.	1599
36	(pod cast\$ or podcast\$ or blog or blogs or blogging or blogosphere).ti,ab.	123
37	(digital adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	188
38	(wireless adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	114
39	(online adj3 (forum\$ or communit\$ or discussion\$)).ti,ab.	133
40	((digital or interactive or mobile or online or viral or buzz) adj3 (market\$ or campaign\$ or advert\$ or commercial\$)).ti,ab.	48
41	(open space technolog\$ or social networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\$).ti,ab.	79
42	(viral video or internet buzz or buzz device or advergaming or advergaming).ti,ab.	1
43	or/16-42	64046

44	7 and 15 and 43	646
45	business/ and (cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	9
46	((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	111
47	((purchase\$ or retail\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	64
48	((buy or buys or buying or bought) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	24
49	((vend or vends or vending) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	11
50	((shop or shops or shopping or shopped) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	3
51	((store or stores or supermarket\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	18
52	tobacconist\$.ti,ab.	2
53	or/45-52	171
54	7 and 53	105
55	((prevent\$ or regulat\$ or control\$ or restrict\$ or prohibit\$ or ban\$ or limit\$ or illegal or law or legislat\$ or policy or policies) adj3 (smoke or smoking or tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	2026
56	exp Smoking/pc [Prevention and Control]	2183
57	55 or 56	3441
58	7 and 57	1451
59	44 or 54 or 58	1841
60	limit 59 to (□adolesc and yr="1990 – 2007")	1749
61	exp asia/ or exp □doles/ or exp south □dolesc/ or developing countries/	48491
62	60 not 61	1649

## E. BRITISH NURSING INDEX

#	Search History	Results
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1	exp children/		1235
2	exp Adolescents/		1456
3	(young adj (person\$ or people or adult\$ or individual\$)).ti,ab.		1120
4	(under 18\$ or underage\$ or under eighteen\$).ti,ab.		22
5	(boy or boys or girl or girls).ti,ab.		447
6	(child\$ or □dolescent\$ or kid or kids or youth\$ or youngster\$ or minor or minors or teen\$ or juvenile\$ or student\$ or pupil or pupils).ti,ab.		24116
7	or/1-6		25177
8	exp smoking/		1924
9	(smoking or antismoking or anti-smoking).ti,ab.		1912

10	(smoker or smokers).ti,ab.		205
11	tobacco.ti,ab.		312
12	(cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.		275
13	or/8-12		2307
14	exp mass media/		442
15	"telephone use"/		471
16	mass media.ti,ab.		63
17	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\$ or journal\$ or magazine\$)).ti,ab.		114

18	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (dvd or dvds or video\$ or motion picture\$ or film or films or broadcast\$ or radio or televised or <input type="checkbox"/> dolescen)).ti,ab.		19
19	((phone or telephone or mobile or cellular) adj3 (counsel\$ or hotline\$ or hot line\$ or quitline\$ or quit line\$ or helpline\$ or help line\$ or adviceline\$ or advice line\$)).ti,ab.		127
20	((internet or web\$) adj3 (advert\$ or campaign\$ or information or program\$ or commercial\$)).ti,ab.		129
21	(text messag\$ or texting or sms or short messag\$ service\$ or instant messag\$ or videomessag\$ or video messag\$ or multimedia messag\$).ti,ab.		8
22	(e-mail\$ or email\$ or electronic mail\$ or mailing list\$).ti,ab.		174
23	(pod cast\$ or podcast\$ or blog or blogs or blogging or blogosphere).ti,ab.		1
24	(digital adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.		9
25	(wireless adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.		7
26	(online adj3 (forum\$ or communit\$ or discussion\$)).ti,ab.		23

27	((digital or interactive or mobile or online or viral or buzz) adj3 (market\$ or campaign\$ or advert\$ or commercial\$)).ti,ab.		3
28	(open space technolog\$ or social networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\$).ti,ab.		1
29	(viral video or internet buzz or buzz device or advergaming or advergaming\$ or advergaming\$ or advergaming\$).ti,ab.		0
30	or/14-29		1411
31	7 and 13 and 30		23
32	((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.		7
33	((purchase\$ or retail\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.		2
34	((buy or buys or buying or bought) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.		3
35	((vend or vends or vending) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.		0

36	((shop or shops or shopping or shopped) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.		1
37	((store or stores or supermarket\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.		0
38	tobacconist\$.ti,ab.		0
39	or/32-38		10
40	7 and 39		8
41	((prevent\$ or regulat\$ or control\$ or restrict\$ or prohibit\$ or ban\$ or limit\$ or illegal or law or legislat\$ or policy or policies) adj3 (smoke or smoking or tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.		244
42	7 and 41		59
43	31 or 40 or 42		84

44	limit 43 to yr="1990 – 2008"		81
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**F. HMIC**

#	Search History	Results
1	exp children/	12156
2	exp young people/	6147
3	(young adj (person\$ or people or adult\$ or individual\$)).ti,ab.	3823
4	(under 18\$ or underage\$ or under eighteen\$).ti,ab.	6468
5	(boy or boys or girl or girls).ti,ab.	738
6	(child\$ or □dolescent\$ or kid or kids or youth\$ or youngster\$ or minor or minors or teen\$ or juvenile\$ or student\$ or pupil or pupils).ti,ab.	26523
7	or/1-6	36549
8	exp smoking/	2104
9	(smoking or antismoking or anti-smoking).ti,ab.	3523
10	(smoker or smokers).ti,ab.	949
11	tobacco/ or tobacco.ti,ab.	1151
12	(cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	855
13	or/8-12	4630
14	exp mass media/	478
15	mobile telephones/	76
16	email/	100
17	radio/ or television/ or telephone/	165
18	advertising/	317
19	"dissemination of information"/	374
20	cinema/	4
21	multi media/	56
22	exp magnetic tape recordings/	186
23	exp newspapers/	59
24	exp periodicals/	271
25	pamphlets/	10
26	internet/	999
27	telecommunications/	232
28	mass media.ti,ab.	163
29	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\$ or journal\$ or magazine\$)).ti,ab.	345
30	((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (dvd or dvds or video\$ or motion picture\$ or film or films or broadcast\$ or radio or televised or □dolescen)).ti,ab.	73

31	((phone or telephone or mobile or cellular) adj3 (counsel\$ or hotline\$ or hot line\$ or quitline\$ or quit line\$ or helpline\$ or help line\$ or adviceline\$ or advice line\$)).ti,ab.	188
32	((internet or web\$) adj3 (advert\$ or campaign\$ or information or program\$ or commercial\$)).ti,ab.	425
33	(text messag\$ or texting or sms or short messag\$ service\$ or instant messag\$ or videomessag\$ or video messag\$ or multimedia messag\$).ti,ab.	70
34	(e-mail\$ or email\$ or electronic mail\$ or mailing list\$).ti,ab.	278
35	(pod cast\$ or podcast\$ or blog or blogs or blogging or blogosphere).ti,ab.	4
36	(digital adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	31
37	(wireless adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.	6
38	(online adj3 (forum\$ or communit\$ or discussion\$)).ti,ab.	20
39	((digital or interactive or mobile or online or viral or buzz) adj3 (market\$ or campaign\$ or advert\$ or commercial\$)).ti,ab.	14
40	(open space technolog\$ or social networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\$).ti,ab.	10
41	(viral video or internet buzz or buzz device or advergaming or advergaming).ti,ab.	0
42	or/14-41	4031
43	7 and 13 and 42	69
44	trade/ and (cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.	0
45	tobacco industry/	140
46	44 or 45	140
47	((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	68
48	((purchase\$ or retail\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	19
49	((buy or buys or buying or bought) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	4
50	((vend or vends or vending) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	1
51	((shop or shops or shopping or shopped) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	2

52	((store or stores or supermarket\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	0
53	tobacconist\$.ti,ab.	1
54	or/46-53	212
55	7 and 54	67
56	((prevent\$ or regulat\$ or control\$ or restrict\$ or prohibit\$ or ban\$ or limit\$ or illegal or law or legislat\$ or policy or policies) adj3 (smoke or smoking or tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.	785
57	7 and 56	275
58	43 or 55 or 57	339
59	limit 58 to yr="1990 – 2007"	315
60	exp asia/ or exp □doles/ or exp south □dolesc/ or exp developing countries/	2902
61	59 not 60	303

**G. ASSIA – 502 Records****SOCIOLOGICAL ABSTRACTS – 305 Records**

young person\* or young people or young adult\* or young individual\*  
 under 18\* or underage\* or under eighteen\*  
 boy or boys or girl or girls  
 child\* or □dolescent\* or kid or kids or youth\* or youngster\* or minor or minors or  
 teen\* or juvenile\* or student\* or pupil or pupils  
 #1 or #2 or #3 or #4  
 smoking or antismoking or anti-smoking or smoker or smokers or tobacco  
 cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine  
 #6 or #7  
 mass media  
 (advert\* or campaign\* or program\* or commercial\*) within 3 (tv or television or cable  
 or satellite or cinema or cinemas or theatre or theatres or theater or theaters or  
 movies or media or newspaper\* or journal\* or magazine\* or dvd or dvds or video\* or  
 motion picture\* or film or films or broadcast\* or radio or televised or □dolescen)  
 (phone or telephone or mobile or cellular) within 3 (counsel\* or hotline\* or hot line\* or  
 quitline\* or quit line\* or helpline\* or help line\* or adviceline\* or advice line\*)  
 (internet or web\*) within 3 (advert\* or campaign\* or information or program\* or  
 commercial\*)  
 text messag\* or texting or sms or short messag\* service\* or instant messag\* or  
 videomessag\* or video messag\* or multimedia messag\*  
 e-mail\* or email\* or electronic mail\* or mailing list\*  
 pod cast\* or podcast\* or blog or blogs or blogging or blogosphere  
 digital within 3 (media or device\* or platform\* or technolog\*)  
 wireless within 3 (media or device\* or platform\* or technolog\*)  
 online within 3 (forum\* or communit\* or discussion\*)  
 (digital or interactive or mobile or online or viral or buzz) within 3 (market\* or  
 campaign\* or advert\* or commercial\*)  
 open space technolog\* or social networking or bebo or facebook or myspace or  
 netlog or profileheaven or xanga or yahoo\*

viral video or internet buzz or buzz device or advergaming or advergaming or advergaming

#9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21

#5 and #8 and #22

(sale or sales or sell or selling or sold or supply or supplies or supplied or supply\*) within 3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)

(purchase\* or retail\*) within 3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)

(buy or buys or buying or bought) within 3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)

(vend or vends or vending) within 3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)

(shop or shops or shopping or shopped) within 3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)

(store or stores or supermarket\*) within 3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)

tobacconist\*

#24 or #25 or #26 or #27 or #28 or #29 or #30

#5 and #31

(prevent\* or regulat\* or control\* or restrict\* or prohibit\* or ban\* or limit\* or illegal or law or legislat\* or policy or policies) within 3 (smoke or smoking or tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)

#5 and #33

#23 or #32 or #34

limit 35 to (□dolesc language and yr="1990 – 2007")

## H. SOCIAL POLICY & PRACTICE

NICE. Smoking and children

Social Policy & Practice/Ovid WebSPIRS

SocPolSmokChild (26-06-07)

#1 (young adj (person\* or people or adult\* or individual\*)) in ti,ab,de

#2 (under 18\* or underage\* or under eighteen\*) in ti,ab,de

#3 (boy or boys or girl or girls) in ti,ab,de

#4 (child\* or □adolescent\* or kid or kids or youth\* or youngster\* or minor or minors or teen\* or juvenile\* or student\* or pupil or pupils) in ti,ab,de

#5 #1 or #2 or #3 or #4

#6 (smoking or antismoking or anti-smoking) in ti,ab,de

#7 (smoker or smokers) in ti,ab,de

#8 tobacco in ti,ab,de

#9 (cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine) in ti,ab,de

#10 #6 or #7 or #8 or #9

#11 mass media in ti,ab,de

#12 ((advert\* or campaign\* or program\* or commercial\*) near3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\* or journal\* or magazine\*)) in ti,ab,de

#13 ((advert\* or campaign\* or program\* or commercial\*) near3 (dvd or dvds or video\* or motion picture\* or film or films or broadcast\* or radio or televised or □dolescen)) in ti,ab,de

#14 ((phone or telephone or mobile or cellular) near3 (counsel\* or hotline\* or hot line\* or quitline\* or quit line\* or helpline\* or help line\* or adviceline\* or advice line\*)) in ti,ab,de

#15 ((internet or web\*) near3 (advert\* or campaign\* or information or program\* or commercial\*)) in ti,ab,de

#16 (text messag\* or texting or sms or short messag\* service\* or instant messag\* or videomessag\* or video messag\* or multimedia messag\*) in ti,ab,de

#17 (e-mail\* or email\* or electronic mail\* or mailing list\*) in ti,ab,de

#18 (pod cast\* or podcast\* or blog or blogs or blogging or blogosphere) in ti,ab,de

#19 (digital near3 (media or device\* or platform\* or technolog\*)) in ti,ab,de

#20 (wireless near3 (media or device\* or platform\* or technolog\*)) in ti,ab,de

#21 (online near3 (forum\* or communit\* or discussion\*)) in ti,ab,de

#22 ((digital or interactive or mobile or online or viral or buzz) near3 (market\* or campaign\* or advert\* or commercial\*)) in ti,ab,de

#23 (open space technolog\* or social networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\*) in ti,ab,de

#24 (viral video or internet buzz or buzz device or advergaming or advergaminges or advergaming) in ti,ab,de

#25 #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24

#26 #5 and #10 and #25

#27 ((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\*) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)) in ti,ab,de

#28 ((purchase\* or retail\*) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)) in ti,ab,de

#29 ((buy or buys or buying or bought) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)) in ti,ab,de

#30 ((vend or vends or vending) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)) in ti,ab,de

#31 ((shop or shops or shopping or shopped) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)) in ti,ab,de

#32 ((store or stores or supermarket\*) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)) in ti,ab,de

#33 tobacconist\* in ti,ab,de

#34 #27 or #28 or #29 or #30 or #31 or #32 or #33

#35 #5 and #34

#36 ((prevent\* or regulat\* or control\* or restrict\* or prohibit\* or ban\* or limit\* or illegal or law or legislat\* or policy or policies) near3 (smoke or smoking or tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)) in ti,ab,de

#37 #5 and #36

#38 #26 or #35 or #37

#39 (#26 or #35 or #37) and (PY:1M = 1990-2007)

## I. SIGLE

NICE. Smoking and children

SIGLE/CD-ROM

SIGSmokChild (26-06-07)

young adj (person\* or people or adult\* or individual\*)

under 18\* or underage\* or under eighteen\*

boy or boys or girl or girls

child\* or □adolescent\* or kid or kids or youth\* or youngster\* or minor or minors or  
 teen\* or juvenile\* or student\* or pupil or pupils  
 #1 or #2 or #3 or #4  
 smoking or antismoking or anti-smoking  
 smoker or smokers  
 tobacco  
 (cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or hand roll\* or  
 nicotine)  
 #6 or #7 or #8 or #9  
 mass media  
 (advert\* or campaign\* or program\* or commercial\*) near3 (tv or television or cable or  
 satellite or cinema or cinemas or theatre or theatres or □adolesc or □dolesce or  
 movies or media or newspaper\* or journal\* or magazine\*)  
 (advert\* or campaign\* or program\* or commercial\*) near3 (dvd or dvds or video\* or  
 motion picture\* or film or films or broadcast\* or radio or televised or □dolescen)  
 (phone or telephone or mobile or cellular) near3 (counsel\* or hotline\* or hot line\* or  
 quitline\* or quit line\* or helpline\* or help line\* or adviceline\* or advice line\*)  
 (internet or web\*) near3 (advert\* or campaign\* or information or program\* or  
 commercial\*)  
 (text messag\* or texting or sms or short messag\* service\* or instant messag\* or  
 videomessag\* or video messag\* or multimedia messag\*)  
 (e-mail\* or email\* or electronic mail\* or mailing list\*)  
 pod cast\* or podcast\* or blog or blogs or blogging or blogosphere  
 digital near3 (media or device\* or platform\* or technolog\*)  
 wireless near3 (media or device\* or platform\* or technolog\*)  
 online near3 (forum\* or communit\* or discussion\*)  
 (digital or interactive or mobile or online or viral or buzz) near3 (market\* or campaign\*  
 or advert\* or commercial\*)  
 (open space technolog\* or social networking or bebo or facebook or myspace or  
 netlog or profileheaven or xanga or yahoo\*)  
 viral video or internet buzz or buzz device or adverggame or adverggames or  
 advergaming  
 #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or  
 #23 or #24  
 #5 and #10 and #25  
 (sale or sales or sell or selling or sold or supply or supplies or supplied or supply\*)  
 near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or  
 hand roll\* or nicotine)  
 (purchase\* or retail\*) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis or  
 kretek or handroll\* or hand roll\* or nicotine)  
 (buy or buys or buying or bought) near3 (tobacco or cigar\* or bidi or bidis or beedi or  
 beedis or kretek or handroll\* or hand roll\* or nicotine)  
 (vend or vends or vending) near3 (tobacco or cigar\* or bidi or bidis or beedi or beedis  
 or kretek or handroll\* or hand roll\* or nicotine)  
 (shop or shops or shopping or shopped) near3 (tobacco or cigar\* or bidi or bidis or  
 beedi or beedis or kretek or handroll\* or hand roll\* or nicotine)  
 (store or stores or supermarket\*) near3 (tobacco or cigar\* or bidi or bidis or beedi or  
 beedis or kretek or handroll\* or hand roll\* or nicotine)  
 tobacconist\*  
 #27 or #28 or #29 or #30 or #31 or #32 or #33  
 #5 and #34  
 (prevent\* or regulat\* or control\* or restrict\* or prohibit\* or ban\* or limit\* or illegal or  
 law or legislat\* or policy or policies) near3 (smoke or smoking or tobacco or cigar\* or  
 bidi or bidis or beedi or beedis or kretek or handroll\*)  
 #5 and #36

#26 or #35 or #37  
 #38 and (PY = 1990-2020)

## J. NATIONAL RESEARCH REGISTER

NICE. Smoking and children  
 NRR/Online  
 NRRSmokChild (27-06-07)

- #1. MASS MEDIA explode all trees (MeSH) 173
- #2. CELLULAR PHONE single term (MeSH) 8
- #3. ELECTRONIC MAIL explode all trees (MeSH) 4
- #4. RADIO explode all trees (MeSH) 0
- #5. TELEVISION explode all trees (MeSH) 165
- #6. TELEPHONE explode all trees (MeSH) 91
- #7. ADVERTISING explode all trees (MeSH) 3
- #8. HOTLINES explode all trees (MeSH) 54
- #9. INFORMATION DISSEMINATION explode all trees (MeSH) 2
- #10. PERSUASIVE COMMUNICATION explode all trees (MeSH) 1
- #11. NONVERBAL COMMUNICATION explode all trees (MeSH) 77
- #12. MOTION PICTURES explode all trees (MeSH) 4
- #13. MULTIMEDIA explode all trees (MeSH) 24
- #14. COMMUNICATIONS MEDIA explode all trees (MeSH) 1339
- #15. TAPE RECORDING explode all trees (MeSH) 170
- #16. SERIAL PUBLICATIONS explode all trees (MeSH) 13
- #17. PAMPHLETS explode all trees (MeSH) 90
- #18. INTERNET explode all trees (MeSH) 163
- #19. TELECOMMUNICATIONS explode all trees (MeSH) 334
- #20. (mass next media) 18
- #21. ((advert\* near tv) or (advert\* near television) or (advert\* near cable) or (advert\* near satellite) or (advert\* near cinema) or (advert\* near cinemas) or (advert\* near theatre) or (advert\* near theatres) or (advert\* near theatre) or (advert\* near theatres) or (advert\* near movies) or (advert\* near media) or (advert\* near newspaper\*) or (advert\* near journal\*) or (advert\* near magazine\*)) 79
- #22. ((campaign\* near tv) or (campaign\* near television) or (campaign\* near cable) or (campaign\* near satellite) or (campaign\* near cinema) or (campaign\* near cinemas) or (campaign\* near theatre) or (campaign\* near theatres) or (campaign\* near theatre) or (campaign\* near theatres) or (campaign\* near movies) or (campaign\* near media) or (campaign\* near newspaper\*) or (campaign\* near journal\*) or (campaign\* near magazine\*)) 10
- #23. ((program\* near tv) or (program\* near television) or (program\* near cable) or (program\* near satellite) or (program\* near cinema) or (program\* near cinemas) or (program\* near theatre) or (program\* near theatres) or (program\* near theatre) or (program\* near theatres) or (program\* near movies) or (program\* near media) or (program\* near newspaper\*) or (program\* near journal\*) or (program\* near magazine\*)) 10
- #24. ((commercial\* near tv) or (commercial\* near television) or (commercial\* near cable) or (commercial\* near satellite) or (commercial\* near cinema) or (commercial\* near cinemas) or (commercial\* near theatre) or (commercial\* near theatres) or (commercial\* near theatre) or (commercial\* near theatres) or (commercial\* near movies) or (commercial\* near media) or (commercial\* near newspaper\*) or (commercial\* near journal\*) or (commercial\* near magazine\*)) 7
- #25. ((advert\* near dvd) or (advert\* near dvds) or (advert\* near video\*) or (advert\* near (motion next picture\*)) or (advert\* near film) or (advert\* near films) or (advert\*

near broadcast\*) or (advert\* near radio) or (advert\* near televised) or (advert\* near □dolescen)) 15

#26. ((campaign\* near dvd) or (campaign\* near dvds) or (campaign\* near video\*) or (campaign\* near (motion next picture\*)) or (campaign\* near film) or (campaign\* near films) or (campaign\* near broadcast\*) or (campaign\* near radio) or (campaign\* near televised) or (campaign\* near □dolescen)) 6

#27. ((program\* near dvd) or (program\* near dvds) or (program\* near video\*) or (program\* near (motion next picture\*)) or (program\* near film) or (program\* near films) or (program\* near broadcast\*) or (program\* near radio) or (program\* near televised) or (program\* near □dolescen)) 32

#28. ((commercial\* near dvd) or (commercial\* near dvds) or (commercial\* near video\*) or (commercial\* near (motion next picture\*)) or (commercial\* near film) or (commercial\* near films) or (commercial\* near broadcast\*) or (commercial\* near radio) or (commercial\* near televised) or (commercial\* near □dolescen)) 5

#29. ((phone near counsel\*) or (phone near hotline\*) or (phone near (hot next line\*)) or (phone near quitline\*) or (phone near (quit next line\*)) or (phone near helpline\*) or (phone near (help next line\*)) or (phone near adviceline\*) or (phone near (advice next line\*))) 3

#30. ((telephone near counsel\*) or (telephone near hotline\*) or (telephone near (hot next line\*)) or (telephone near quitline\*) or (telephone near (quit next line\*)) or (telephone near helpline\*) or (telephone near (help next line\*)) or (telephone near adviceline\*) or (telephone near (advice next line\*))) 63

#31. ((cellular near counsel\*) or (cellular near hotline\*) or (cellular near (hot next line\*)) or (cellular near quitline\*) or (cellular near (quit next line\*)) or (cellular near helpline\*) or (cellular near (help next line\*)) or (cellular near adviceline\*) or (cellular near (advice next line\*))) 0

#32. ((internet near advert\*) or (internet near campaign\*) or (internet near information) or (internet near program\*) or (internet near commercial\*)) 100

#33. ((web near advert\*) or (web near campaign\*) or (web near information) or (web near program\*) or (web near commercial\*)) 64

#34. ((text next messag\*) or texting or sms or (short next messag\* next service\*) or (instant next messag\*) or videomessag\* or (video next messag\*) or (multimedia next messag\*)) 28

#35. ((pod next cast\*) or podcast\* or blog or blogs or blogging or blogosphere) 0

#36. ((digital near media) or (digital near device\*) or (digital near platform\*) or (digital near technolog\*)) 32

#37. ((wireless near media) or (wireless near device\*) or (wireless near platform\*) or (wireless near technolog\*)) 1

#38. ((online near forum\*) or (online near communit\*) or (online near discussion\*)) 10

#39. ((digital near market\*) or (digital near campaign\*) or (digital near advert\*) or (digital near commercial\*)) 2

#40. ((interactive near market\*) or (interactive near campaign\*) or (interactive near advert\*) or (interactive near commercial\*)) 0

#41. ((mobile near market\*) or (mobile near campaign\*) or (mobile near advert\*) or (mobile near commercial\*)) 1

#42. ((online near market\*) or (online near campaign\*) or (online near advert\*) or (online near commercial\*)) 2

#43. ((viral near market\*) or (viral near campaign\*) or (viral near advert\*) or (viral near commercial\*)) 7

#44. ((buzz near market\*) or (buzz near campaign\*) or (buzz near advert\*) or (buzz near commercial\*)) 0

#45. ((open next space next technolog\*) or (social next networking) or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\*) 3

#46. (e-mail\* or email\* or (electronic next mail\*) or (mailing next list\*)) 782



- #47. ((viral next video) or (internet next buzz) or (buzz next device) or advergaming or advergaming) 0
- #48. (mobile near counsel) or (mobile near hotline\*) or (mobile near hot line\*) or (mobile near quitline\*) or (mobile near quit line\*) or (mobile near helpline\*) or (mobile near help line\*) or (mobile near adviceline\*) or (mobile near advice line\*) 0
- #49. (#1 or #2 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 #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48) 2656
- #50. SMOKING explode all trees (MeSH) 402
- #51. (smoking or antismoking or anti-smoking or smoker or smokers or tobacco) 1812
- #52. TOBACCO explode all trees (MeSH) 6
- #53. TOBACCO USE DISORDER explode all trees (MeSH) 20
- #54. (cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine) 298
- #55. TOBACCO SMOKELESS explode all trees (MeSH) 3
- #56. (#50 or #51 or #52 or #53 or #54 or #55) 1863
- #57. CHILD explode all trees (MeSH) 8120
- #58. ADOLESCENT explode all trees (MeSH) 1893
- #59. ((young near person\*) or (young near people) or (young near adult\*) or (young near individual\*)) 2264
- #60. ((under next 18\*) or underage\* or (under next eighteen\*)) 211
- #61. (boy or boys or girl or girls) 339
- #62. (child\* or adolescent\* or kid or kids or youth\* or youngster\* or minor or minors or teen\* or juvenile\* or student\* or pupil or pupils) 29908
- #63. (#57 or #58 or #59 or #60 or #61 or #62) 30465
- #64. (#49 and #56 and #63) 20
- #65. COMMERCE explode all trees (MeSH) 18
- #66. (cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine) 298
- #67. (#65 and #66) 0
- #68. TOBACCO INDUSTRY explode all trees (MeSH) 0
- #69. (#67 or #68) 0
- #70. tobacconist\* 0
- #71. ((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\*) and (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine)) 17
- #72. ((purchas\* or retail\*) and (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine)) 2
- #73. ((buy or buys or buying or bought) and (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine)) 1
- #74. ((vend or vends or vending) and (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine)) 0
- #75. ((shop or shops or shopping or shopped) and (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine)) 1
- #76. ((store or stores or supermarket\*) and (tobacco or cigar\* or bidi or bidis or beedi or beedis or kretek or handroll\* or (hand next roll\*) or nicotine)) 1
- #77. (#69 or #70 or #71 or #72 or #73 or #74 or #75 or #76) 21
- #78. (#77 and #63 and #56) 9
- #79. (#64 or #78)

## K. CURRENT CONTENTS

**Current Contents Search®: Bibliogr. Records – 1995 to date (CBIB)**

<http://www.datastarweb.com/nice>

(young adj person or young adj persons or young adj people or young adj adult or young adj adults or young adj individual or young adj individuals).ti,ab.

(under adj 18s or underage\$ or under adj eighteen\$).ti,ab.

(boy or boys or girl or girls).ti,ab.

(child or children or adolescent or adolescents or adolescence or kid or kids or youth or youths or youngster\$ or minor or minors or teen\$ or juvenile or juveniles or student or students or pupil or pupils).ti,ab.

1 or 2 or 3 or 4

(smoking or antismoking or anti adj smoking or smoker or smokers or tobacco).ti,ab.

(cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine).ti,ab.

6 or 7

(mass adj media).ti,ab.

((advert\$ or campaign\$ or program or programs or programme or programmes or commercial or commercials) near (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\$)).ti,ab.

((advert\$ or campaign\$ or program or programs or programme or programmes or commercial or commercials) near (magazine\$ or dvd or dvds or video or videos or motion adj picture or motion adj pictures or film or films or broadcast or broadcasts or radio or televised or □dolescen)).ti,ab.

((advert\$ or campaign\$ or program or programs or programme or programmes or commercial or commercials) near (journal or journals)).ti,ab.

((phone or telephone or mobile or cellular) near (counsel or counseling or □dolescent or □dolescent or hotline\$ or (hot adj (line or lines)) or quitline\$ or (quit adj (line or lines)) or helpline\$ or (help adj (line or lines)) or adviceline\$ or (advice adj (line or lines)))).ti,ab.

((internet or web) near (advert\$ or campaign\$ or information or program or programs or programme or programmes or commercial or commercials)).ti,ab.

(text adj message or text adj messages or text adj messaging or texting or sms or short adj message adj service or instant adj message or instant adj messaging or videomessag\$ or video adj message or video adj messaging or multimedia adj message or multimedial adj messaging).ti,ab.

(e-mail\$ or email\$ or (electronic adj (mail or mails)) or (mailing adj (list or lists))).ti,ab.

((pod adj (cast or casts)) or podcast\$ or blog or blogs or blogging or blogosphere).ti,ab.

(digital near (media or device or devices or platform or platforms or technology or technologies)).ti,ab.

(wireless near (media or device or devices or platform or platforms or technology or technologies)).ti,ab.

(online near (forum or forums or community or communities or discussion or discussions)).ti,ab.

((digital or interactive or mobile or online or viral or buzz) near (market or markets or campaign or campaigns or advert\$ or commercial)).ti,ab.

(open adj space adj technology or open adj space adj technologies or social adj networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\$).ti,ab.

(viral adj video or internet adj buzz or buzz adj device or adverggame or adverggames or advergaming).ti,ab.

9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23

5 and 8 and 24

((sale or sales or sell or selling or sold or supply or supplies or supplied) near (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

((purchas\$ or retail\$) near (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

((buy or buys or buying or bought) near (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

((vend or vends or vending) near (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

((shop or shops or shopping or shopped) near (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

((store or stores or supermarket\$) near (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

Tobacconist\$.ti,ab.

26 or 27 or 28 or 29 or 30 or 31 or 32

5 and 33

((prevent or preventing or prevention or prevents or prevented or regulate or regulates or regulating or regulation or regulations or regulated or control or controls or controlling or controlled or restrict or restricts or restricting or restricted or restriction or restrictions) near (smoke or smoking or tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

((prohibit or prohibits or prohibited or prohibition or prohibiting or ban or bans or banned or banning or limit or limits or limited or limiting or illegal or law or legislate or legislates or legislated or legislation or legislating or policy or policies) near (smoke or smoking or tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand adj roll or hand adj rolled or hand adj rolling or hand adj rolls or nicotine)).ti,ab.

35 or 36

5 and 37

25 or 34 or 38

LG=EN

39 and 40

## L. PSYCINFO

NICE. Smoking and children

PsycINFO/Ovid Web

PsycSmokChild (25-06-07)

1. exp tobacco smoking/
2. (smoking or antismoking or anti-smoking).ti,ab.
3. (smoker or smokers).ti,ab.
4. tobacco.ti,ab.
5. (cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.
6. exp Smokeless Tobacco/
7. or/1-6
8. mass media/
9. exp Computer Mediated Communication/

10. exp Electronic Communication/
11. radio/ or television/ or television advertising/ or telephone systems/
12. advertising/ or hot line services/
13. exp Information Dissemination/
14. exp Persuasive Communication/
15. exp Nonverbal Communication/
16. exp Films/
17. hypermedia/
18. Communications Media/
19. exp Audiotapes/
20. Videotape Recorders/ or Videotapes/
21. news media/ or newspapers/ or magazines/
22. internet/
23. Telecommunications Media/
24. mass media.ti,ab.
25. ((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (tv or television or cable or satellite or cinema or cinemas or theatre or theatres or theater or theaters or movies or media or newspaper\$ or journal\$ or magazine\$)).ti,ab.
26. ((advert\$ or campaign\$ or program\$ or commercial\$) adj3 (dvd or dvds or video\$ or motion picture\$ or film or films or broadcast\$ or radio or televised or □dolescen)).ti,ab.
27. ((phone or telephone or mobile or cellular) adj3 (counsel\$ or hotline\$ or hot line\$ or quitline\$ or quit line\$ or helpline\$ or help line\$ or adviceline\$ or advice line\$)).ti,ab.
28. ((internet or web\$) adj3 (advert\$ or campaign\$ or information or program\$ or commercial\$)).ti,ab.
29. (text messag\$ or texting or sms or short messag\$ service\$ or instant messag\$ or videomessag\$ or video messag\$ or multimedia messag\$).ti,ab.
30. (e-mail\$ or email\$ or electronic mail\$ or mailing list\$).ti,ab.
31. (pod cast\$ or podcast\$ or blog or blogs or blogging or blogosphere).ti,ab.
32. (digital adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.
33. (wireless adj3 (media or device\$ or platform\$ or technolog\$)).ti,ab.
34. (online adj3 (forum\$ or communit\$ or discussion\$)).ti,ab.
35. ((digital or interactive or mobile or online or viral or buzz) adj3 (market\$ or campaign\$ or advert\$ or commercial\$)).ti,ab.
36. (open space technolog\$ or social networking or bebo or facebook or myspace or netlog or profileheaven or xanga or yahoo\$).ti,ab.
37. (viral video or internet buzz or buzz device or advergaming or advergaming).ti,ab.
38. or/8-37
39. 7 and 38
40. business/ and (cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine).ti,ab.
41. ((sale or sales or sell or selling or sold or supply or supplies or supplied or supply\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.
42. ((purchase\$ or retail\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.
43. ((buy or buys or buying or bought) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.
44. ((vend or vends or vending) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.
45. ((shop or shops or shopping or shopped) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.

46. ((store or stores or supermarket\$) adj3 (tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.
47. tobacconist\$.ti,ab.
48. or/40-47
49. ((prevent\$ or regulat\$ or control\$ or restrict\$ or prohibit\$ or ban\$ or limit\$ or illegal or law or legislat\$ or policy or policies) adj3 (smoke or smoking or tobacco or cigar\$ or bidi or bidis or beedi or beedis or kretek or handroll\$ or hand roll\$ or nicotine)).ti,ab.
50. developing countries/
51. (□doles or asia or south □dolesc).lo.
52. 50 or 51
53. limit 39 to (100 childhood or 160 preschool age or 180 school age or 200 adolescence )
54. limit 48 to (100 childhood or 160 preschool age or 180 school age or 200 adolescence )
55. limit 49 to (100 childhood or 160 preschool age or 180 school age or 200 adolescence )
56. 53 or 54 or 55
57. limit 56 to yr="1990 – 2007"
58. 57 not 52
59. limit 58 to □dolesc language

## M. TRIP

<http://www.tripdatabase.com>

(child\* or □adolescent\*) AND (smoking or smoker\* or tobacco) in Title

((child\* or □adolescent\*) AND (smoking or smoker\* or tobacco) AND "mass media") in Title and Text

((child\* or □adolescent\*) AND (smoking or smoker\* or tobacco) AND (adverti\* or commercial or purchase or buy or sell or sale\* or price\*) in Title and Text

## N. HSTAT

<http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat>

Browsed the collections from the HSTAT homepage. Six items were identified.

## O. WEBSITES SEARCHED

- |  |   |
|--|---|
| 1) Centre for Tobacco Control Research | <a href="http://www.ctcr.stir.ac.uk/">http://www.ctcr.stir.ac.uk/</a>             |
| 2) Ash                                 | <a href="http://www.ash.org.uk/">http://www.ash.org.uk/</a>                       |
| 3) Quit                                | <a href="http://www.quit.org.uk/">http://www.quit.org.uk/</a>                     |
| 4) Department of Health.               | <a href="http://www.dh.gov.uk/en/index.htm">http://www.dh.gov.uk/en/index.htm</a> |

## APPENDIX B – Excluded Studies

<i>Paper</i>	<i>Reason for exclusion</i>
Altman, D. G., Wheelis, A. Y., McFarlane, M., Lee, H., & Fortman, S. P. (1999). The relationship between tobacco access and use among adolescents: a four community study. <i>Social Science &amp; Medicine</i> , 48, 759-775.	Covered in Cochrane Review. Community-based intervention: Monterey County, California
Altman, D. G., Rasenick-Dous, L., Foster, V., & Tye, J. B. (1991). Sustained Effects of an Educational Program to Reduce Sales of Cigarettes to Minors. <i>American Journal of Public Health</i> , 81, 891-893.	Covered in Cochrane Review. Community-based intervention: Santa Clara County, California.
Banerjee, S. C. & Green K. (2006). Analysis Versus Production: Adolescents Cognitive and Attitudinal Responses to Antismoking Interventions. <i>Journal of Communications</i> , 56, 773-794.	Not an intervention.
Bauman, K. E., LaPrelle, J., Brown, J. D., Koch, G.G., Padgett, C. A. (1991). The influence of three mass media campaigns on variables related to adolescent cigarette smoking: Results of a field experiment. <i>American Journal of Public Health</i> , 81, 597-604.	Covered in Cochrane Review.
Chapman, S., & King, M. (1994). Effects of publicity and a warning letter on illegal cigarette sales to minors. <i>Australian Journal of Public Health</i> , 18, 39-42.	Covered in Cochrane Review.
Chen, V., & Foster J. L. (2006) The long-term effect of local policies to restrict retail sale of tobacco to youth. <i>Nicotine &amp; Tobacco Research</i> , 8, 371-377.	Community-based intervention: 14 communities in Minnesota.
Cheng, T. O. (2004). Peer, Parental, and Commercial Influences on Cigarette Smoking among Chinese Youth. <i>Journal of the National Medical Association</i> , 96, 691-692.	Not an intervention. Commentary.
Cummings, K. M., Hyland, A., Saunders-Martin, T., Perla, J. Coppola, P. R., Pechacek, T. F. (1998) Evaluation of an enforcement program to reduce tobacco sales to minors. <i>American Journal of Public Health</i> , 88, 932-936.	Covered in Cochrane Review.
Cummings, K. M., Saunders-Martin, T., Clarke, H., & Perla, J. (1996). Monitoring vendor compliance with tobacco sales laws: Payment vs no payment approaches. <i>American Journal of Public Health</i> , 86, 750-751.	Not relevant to research question.
Curran, J. J. Jr. (1995). Preventing youth access to tobacco products in Maryland. <i>Maryland Medical Journal</i> , 44, 793-195.	Not an intervention
Czyzewska, M., & Ginsburg, H. J. (2007). Explicit and implicit effects of anti-marijuana and anti-tobacco TV advertisements. <i>Addictive Behaviors</i> , 32, 114-127.	Youth are too old
Dovell, R. A., Mowat, D. L., Dorland, J. & Lam, M. (1996) Changes among retailers selling cigarettes to minors. <i>Canadian Journal of Public Health</i> , 87, 66-68.	Covered in Cochrane Review. Community-based intervention: local intervention
Feighery, E. The effects of coming education and enforcement to reduce tobacco sales to minors: a study of four northern California communities. (1991). <i>The Journal of the American Medical Association</i> , 266, 3168-3171.	Covered in Cochrane Review. Community-based intervention: 4 cities in Solano County, California
Flynn, B. S., Worden, J. K., Secker-Walker, R. H., Badger, G. J.	School-based

<p>&amp; Geller, B. M. (1995). Cigarette Smoking Prevention Effects of Mass Media and School Interventions Targeted to Gender and Age Groups. <i>Journal of Health Education</i>, suppl 26, S-45 – S 51</p>	<p>intervention: Four communities in Vermont and south-central New York State, Montana.</p>
<p>Flynn, B. S., Worden, J. K., Secker-Walker, R. H., Pirie, P. L., Badger, G. J., Carpenter, J. H. (1994) Mass media and school interventions for cigarette smoking prevention: Effects 2 years after completion. <i>American Journal of Public Health</i>, 84, 1148-1150.</p>	<p>Covered in Cochrane Review.</p>
<p>Flynn, B.S., Worden, J. K., Secker-Walker, R. H., Badger, G. J. , Geller, B. M., Costanza, M. C. (1992) Prevention of Cigarettes Smoking through Mass Media Intervention and School Programs. <i>American Journal of Public Health</i>, 82, 827-834.</p>	<p>Covered in Cochrane Review.</p>
<p>Forster, J. L., Murray, D. M., Wolfson, M. Blaine, T. M., Wagenaar, A.C. Hennrikus, D. J. (1998). The effects of community policies to reduce youth access to tobacco. <i>American Journal of Public Health</i>, 88, 1193-1198</p>	<p>Covered in Cochrane Review.</p>
<p>Forster, J. L., Hourigan, M. E., &amp; Kelder, S. (1992). Locking devices on cigarette vending machines: Evaluation of a city ordinance. <i>American Journal of Public Health</i>, 81, 1217-1219</p>	<p>Covered in Cochrane Review. Community-based intervention: St. Paul, Minnesota</p>
<p>Gemson, D. H. Moats, H. L. Watkins, B. X. Ganz, M. L., Robinson, S., &amp; Healton, E. (1998). Laying down the law: Reducing illegal tobacco sales to minors in central Harlem. <i>American Journal of Public Health</i>, 88, 936-939.</p>	<p>Covered in Cochrane Review,</p>
<p>Goldstein, A. O., Sobel, R. A., Martin, J. D., Crocker, S. D., Malek, S. H. (1998), How does North Carolina law enforcement limit youth access to tobacco products? <i>North Carolina Medical Journal</i>, 58, 90-94.</p>	<p>No outcomes of interest.</p>
<p>Hafstad, A., Aaro, L. E. (1997). Activating interpersonal influence through provocative appeals: Evaluation of a mass media-based antismoking campaign targeting adolescents. <i>Health Communications</i>, 9, 253-272.</p>	<p>Covered in Cochrane Review.</p>
<p>Hafstad, A. Aaro, L. E., Engeland, A., Andersen A., Langmark, F. Stray-Pedersen, B. (1997). Provocative appeals in anti-smoking mass media campaigns targeting adolescents –the accumulated effect of multiples exposure. <i>Health Education Research</i>, 12, 227-236.</p>	<p>Covered in Cochrane Review.</p>
<p>Hafstad, A., Stray-Pedersen, B., Langmark, F. (1997) Use of provocative emotional appeals in a mass media campaign designed to prevent smoking among adolescents. <i>European Journal of Public Health</i>, 7, 122-127.</p>	<p>Covered in Cochrane Review.</p>
<p>Jason, L. A., Ji, P. Y., Anes, M. D., &amp; Birkhead, S. H. (1991). Active enforcement of cigarettes control laws in the prevention of cigarette sales to minors. <i>The Journal of the American Medical Association</i>, 266, 3159-3161.</p>	<p>Covered in Cochrane Review. Community-based intervention: Santa Clara, California.</p>
<p>Jason, L. A., Berk, M., Schnopp-Wyatt, D. L., &amp; Talbot, B. (1999). Effects of enforcement of youth access laws on smoking prevalence. <i>American Journal of Community Psychology</i>, 27, 143-160</p>	<p>Covered in Cochrane Review. Community-based intervention: Woodridge, Illinois.</p>
<p>Jason, L. A., Billows, W. D., Schnopp-Wyatt, D. L., &amp; King, C. (1996). Long-term findings from Woodridge in reducing illegal cigarette sales to older minors. <i>Evaluation &amp; The Health Professions</i>, 19, 3-13.</p>	<p>Covered in Cochrane Review. Community-based intervention: Woodridge, Illinois</p>

Jason, L. A., Katz, R., Vavra, J., Schnopp-Wyatt, D. L. Talbot, B. (1999). Long-term follow-up of youth access to tobacco laws' impact on smoking prevalence. <i>Journal of Human Behavior in the Social Environment</i> , 2, 1-13	Covered in Cochrane Review. Community-based intervention: Woodridge, Illinois.
Jason, L., Billows, W., Schnopp-Wyatt, D., & King, C. (1996). Reducing the illegal sales of cigarettes to minors: Analysis of alternative enforcement schedules. <i>Journal of Applied Behavior Analysis</i> , 29, 333-344.	Covered in Cochrane Review. Community-based intervention: Chicago
Junck, E., Humphries, J., & Rissel C. (1997) Reducing tobacco sales to minors in Manly: 10 months follow-up. <i>Health Promotion Journal of Australia</i> , 7, 29-34.	Covered in Cochrane Review. Community-based intervention: Manly, a suburb in Sydney.
Kaufman, J. S., Jason, L. A., Sawlski, L. M., & Halpert, J. A. (1994). A comprehensive multi-media program to prevent smoking among black students. <i>Journal of Drug Education</i> , 24, 95-108.	Community/School - based intervention: Chicago lung Association initiative
Keay, D. K., Woodruff, S. I., Wildey, M. B., & Kenney, E. M. (1993). Effect of retailer intervention on cigarette sales to minors in San Diego County, California. <i>Tobacco Control</i> , 2, 145-151.	Covered in Cochrane Review. Community-based intervention: San Diego County, California
Krevor, B. S. Liebermn, A., & Gerlach, K. (2002). <i>Tobacco Control</i> , 11, 109-111.	Not an intervention. No outcomes of interest. Special communication, descriptive study.
Krevor, B., Capitman, J. A., Oblak, L. Cannon, J. B. & Ruwe, M. (2003). Preventing illegal tobacco and alcohol sales to minors through electronic age-verification devices: a field effectiveness study. <i>Journal of Public Health Policy</i> , 24, 251-268.	No outcomes of interest. Not relevant to research question.
Perla, J. P. Effects of increase retailer compliance rates on youth smoking behaviours and access to cigarettes. (1998) A dissertation submitted to the Faculty of the Graduate School of State University of New York at Buffalo in partial fulfilment of the requirements for the degree of Doctor of Philosophy, i-x, 1-163	Community-based intervention: 13 suburban communities in Erie County New York.
Powell, L. M., & Chaloupka, F. J. (2005). Parents, public policy, and youth smoking. <i>Journal of Policy Analysis and Management</i> , 24, 93-112.	No relevant outcomes. Emphasis on parental influences on smoking behaviour.
Powell, L.M., Taurus, J.A., & Ross, H. (2005). The importance of peer effects, cigarette prices, and tobacco control policies on youth smoking behaviour. <i>Journal of Health Economics</i> , 24, 950-968.	Tobacco control policies that were examined included local level policies. Furthermore, the paper was not focuses on prevention-participants were smokers. Key focus of paper was impact of peers on smoking.
Powell, L. M., & Chaloupka, F. J. (2005). Parents, public policy, and youth smoking. <i>Journal of Public Policy Analysis and Management</i> , 24, 93-112.	Key focus of paper was impact of parents on smoking. Lack of information on access restrictions. Access restrictions examined



	went beyond those within the scope of this review (i.e. packaging).
Rigotti, N. A., DiFranza, J. R., Chang, Y., Tisdale, T., Kemp, B. & Singer, D. E. (1997). The effect of enforcing tobacco-sales laws on adolescents' access to tobacco and smoking behaviour. <i>The New England Journal of Medicine</i> , 337, 1044-1051.	Covered in Cochrane Review. Community-based intervention: 5 Massachusetts communities.
Siegel, M., Biener, L., Rigotti, N. (1999). The effects of local tobacco sales laws on adolescent smoking initiation. <i>Preventive Medicine</i> , 29, 334-342.	Community-based intervention: local communities in Massachusetts
Skretny, M. T., Cummings, K. M., Sciandra, R., & Marshall, J. (1990). An Intervention to reduce the sale of cigarettes to minors in New York State. <i>New York States Journal of Medicine</i> , 92,, 54-55	Covered in Cochrane Review.
Staff, M., Bennett, C. M., & Angel, P. (2003). Is restricting tobacco sales the answer to adolescent smoking? <i>Preventive Medicine</i> , 37, 529-533.	Covered in Cochrane Review. Community based intervention: 11 northern Sydney metropolitan public secondary schools.
Thomson, C. C., Gokhale, M., Biener, L., Siegel, M.B., & Rigotti, N. A. (2004) Statewide evaluation of youth access ordinances in Practice: Effects of the implementation of a community-level regulation in Massachusetts. <i>Journal of Public Health Management Practice</i> , 10, 481-489.	Community-based intervention: communities in Massachusetts.
Widley, M. B. Woodruff, S., Agro, A., Keay, K., Kenney, E. M. & Conway, T. L. (1995) Sustained effects of educating retailers to reduce cigarettes sales to minors. <i>Public Health Report</i> , 110, 625-629.	Covered in Cochrane Review. Community-based interventions: San Diego County, California.
Woldburg, J. M. (2006) College Students' Responses to Antismoking Messages: Denial, Defiance, and Other Boomerang Effects. <i>Journal of Consumer Affairs</i> , 40, 294-323.	Participants are in college and are therefore too old for the review.
Worden, J. K., Flynn, B. S., Solomon, L. J., Secker-Walker, R. H., Badger, G. J., Carpenter, J. H. (1996) Using Mass Media to Prevent Cigarettes Smoking Among Adolescent Girls. <i>Health Education Quarterly</i> , 23, 453-468.	Covered in Cochrane Review.

## APPENDIX C: Methodology checklist: Cross-sectional studies

Adapted from CPHE Methods Manual Cohort Analysis Methodology Checklist and Thomson, B; Diamond, K.E.; McWilliam, R; Snyder, S.W. (2005) Evaluating the Quality of Evidence from Correlational Research for Evidence-Based Practice, *Exceptional Children*, 71(2): 181-194.

<b>Study identification</b> <i>Include author, title, reference, year of publication</i>	
<b>Guideline topic:</b>	<b>Key question no:</b>
<b>Checklist completed by:</b>	

1a. Are the objectives of the study stated?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1b. Are the hypotheses of the study stated?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
2. Is the sampling frame defined?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
3. Is the analytic sample defined?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
4. Are the dates between which the study was conducted stated or implicit?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
5. Are eligibility criteria stated?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
6. Is the sampling method mentioned?	Well covered Adequately addressed	Not addressed Not reported

	Poorly addressed	Not applicable
7. Is the numbers of participants justified? (what is the power calculation?)	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
8. Are the numbers meeting and not meeting the eligibility criteria stated?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
9. For those not eligible, are the reasons why stated?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
10a. Was the number of the analytic sample at the beginning of the study stated?  Actual N:	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
10b. What is the participation rate? (above 60% is well covered)	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
11a. Was the reliability (repeatability) of the measurement methods mentioned for the exposure?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
11b. Was the reliability (repeatability) of the measurement methods mentioned for the outcomes? (e.g. has the measure been used before?, if observational was there inter-rated reliability?)	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
12a. Was the validity of the measurement methods mentioned for the exposure?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
12b. Was the validity of the measurement method mentioned for the outcome?	Well covered Adequately addressed	Not addressed Not reported

	Poorly addressed	Not applicable
13. Was the type of analyses conducted stated?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
14. Were confounders accounted for in analyses? (multivariate analysis)	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
15. Were missing data accounted for in the analyses? (Did they deal with people who were not eligible or had incomplete surveys, etc).	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
16. How reliable are the results? (If neither the exact p value nor the confidence intervals were reported than poor).		
17. <b>Overall Assessment of Study.</b> How well was the study done to minimise the risk of bias or confounding, and to establish a relationship between the variables under consideration? Code ++, + or -		

## APPENDIX D

### Mass Media Key Informant Interview Guide

#### Preamble:

The purpose of our project is to examine literature on the prevention of the uptake of smoking in children and young people. The review is international in scope and includes: a) mass media interventions (including new media such as pod casts, text messaging, bebo, facebook, and social networking websites) and b) point of sale measures.

A key component of this review is consultation with experts in the area of new media, youth media, advertising, marketing and tobacco use. Due to a lack of published literature in this area, it is necessary to consult with selected key informants to strengthen the project. The purpose of the key informant interview is to gain insight into your experience and expertise in the area of mass media, youth and/or smoking prevention.

We also want to discuss the direction in which this field is heading and any relevant resources that you can identify.

By agreeing to take part in a key informant interview you are allowing the review team to use your feedback in the development of the final report "Guidance on the prevention of the uptake of smoking in children and young people, including point of sale measures." For NICE, (National Institute of Health and Clinical Excellence, UK). Hence, we would appreciate your permission to tape the interview and to be re-contacted in the future (to clarify any uncertainties or to ask permission to use a quote). We would also like your permission to be listed in the report as a key informant. Do you agree?

#### Background

- 1) Can you tell me about your experience/research regarding mass media interventions to prevent children and young people from smoking?

#### Key **mass media** research questions to be addressed:

- 1) In your experience, have mass media interventions been effective in preventing children and young people from smoking?
- 2) In your experience, which mass media interventions are most effective in preventing children and young people from becoming smokers and why?
- 3) In your view, are the interventions delaying rather than preventing the onset of smoking?
- 4) In your view, how would differences between the comparators used in published studies (such as ..... ) and the prevailing situation in England impact on the analysis of effectiveness? (probes: ethnic composition, gender issues; geography; policy context; inequalities etc).

#### Sub-questions to be addressed:

- i) In your view, which aspects/ factors related to the intervention eg way it is delivered, intensity/resources, type of media, focus influence effectiveness?

- iii) Does the site/setting influence effectiveness?
- iv) Does the intensity of the intervention influence effectiveness or duration of effect?
- v) How does effectiveness vary according to the age, sex, socio-economic status or ethnicity of the target audience?
- vi) What are the facilitators and barriers to implementation?

Contextual Questions:

- i) What mass media campaigns (especially those using new forms of media) have been used in your jurisdiction or have you been involved in?
- ii) How do girls and boys and young men and women react to these new media?
- iii) In your view or experience, what works?

Other Questions:

- i) Can you recommend relevant literature/information (unpublished, ongoing, etc.)
- ii) Can you identify any ongoing research in the area/ do you have unpublished data/research that you could make available to us?
- iii) What are, in your view, the future directions of the field of media and tobacco control? What are the opportunities and challenges?

**APPENDIX E****Final List of Key Informants**

<b>Key Informant</b>	<b>Location</b>	<b>Employment</b>	<b>Expertise</b>
Ruth Bosworth	UK	Tobacco Control-QUIT	Ruth is Director of Services for Quit ( <a href="http://www.quit.org.uk">www.quit.org.uk</a> ) and has been in the post since January 2005.. Quit an independent charity in the UK which aims to help people stop smoking. Quit provides cessation support and advice to smokers of any age through telephone quit lines, community based-work and online and email services.
Brian Crook	UK	Advertising- The Bridge Advertising Agency	Brian Crook works for The Bridge which is an advertising agency based in Glasgow. He has worked with Health Scotland and HEBS on their media campaigns. Priorities set by Health Scotland/HEBS targeted two key groups on smoking prevention: -10-12 year olds – aim to prevent starting to smoke -14-16 year olds – those who perceive themselves as “social” smokers (ie occasional smokers) – aim to prevent progress to addicted/regular smoking by highlighting the risks of becoming addicted.
Hein De Vries	Netherlands	Academic- Maastricht University	Hein de Vries is Professor in Cancer Prevention and Health Promotion in the Department of Health Education and Promotion at Maastricht University in the Netherlands. He is a social psychologist by training and has been involved in a number of studies examining smoking prevention. None of these have focused on mass media alone, but a number of them have included a mass or new media element as part of a broader prevention or cessation intervention.
Karen Gutierrez	USA	Tobacco Control	Karen has worked in tobacco control (TC) for about 9 years. Prior to TC she was employed

			in commercial marketing and advertising (Procter and Gamble). For the first six years in TC she worked as consultant, as a CDC fellow, for the US Centre of Disease Control and Prevention assisting states to develop, implement and evaluate tobacco control mass media campaigns. She has also worked internationally developing a tool kit based (examples from 25 countries) on how to put together a mass media campaign.
Gerard Hastings	UK	Academic- University of Stirling and the Open University	Professor Hastings is the Director of the Institute of Social Marketing and its sister center, the CR-UK funded Centre for Tobacco Control Research, at the University of Stirling and the Open University. He was the UK's first Professor of Social Marketing (originally at the University of Strathclyde) and is an expert on marketing and a range of public health issues, including tobacco.
Lawrence Moore	UK	Academic- University of Cardiff	Lawrence Moore is Professor and Director of the Institute for Society, Health and Ethics at the University of Cardiff. He has more than 20 years of research experience in public health with a particular focus on the evaluation of complex interventions, including the use of quasi-experimental designs, randomised controlled trials and the combination of qualitative and quantitative research methods. A number of his studies have focused on smoking, primarily smoking prevention, but many have addressed other health issues.
Cameron Norman	Canada	Academic- University of Toronto	Cameron Norman is an academic at the University of Toronto. He has been researching the internet, youth and smoking interventions and prevention for approximately



			ten years.
Martin Raymond	UK	Campaign/Advertising- Cloudline PR	Martin Raymond is a director of Cloudline PR based in Edinburgh. From 1991-2005 he was Head of Public Affairs/Deputy Director of Programmes & Communications at Health Scotland/HEBS.
Amanda Sandford	UK	Tobacco control- ASH	Amanda Sandford is the research manager at ASH in London. She has worked for the organization for more than 20 years in a variety of capacities but primarily in a research and information role.
Pierre Sequier	France	Campaign/Advertising- HELP	Pierre has been working for Euro Commission (HELP Campaign) for the past three years. The HELP campaign is a tobacco prevention and cessation mass media campaign that was launched by the European Union. It is one the worlds largest public health awareness raising campaigns.