

NICE RAPID REVIEW

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

Executive Summary

November 22, 2007

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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 (++)¹ 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 (+)² 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 (++)³ 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 (+)⁴ 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 (+)^{1,2} 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 (++)³ 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 (++)⁴ 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 (+)⁵ 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 (++)⁶ 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 (+)⁷ review and one RCT (+)⁸ 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 (-)¹ 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 (+)² study indicates that youth deemed websites as effective in obtaining information on smoking, if they incorporated: interactivity, expert-trusted guidance, and appealing graphics. One (+)³ 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 (+)¹ study and one (+)² 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 (+)³ 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 (+)¹ review contends that effective messaging should attend to all message elements. Specifically, evidence from one cross-sectional (+)² study suggests that message processing in older teens improves when messages incorporate unrelated cuts and use suspenseful images. One cross-sectional study (+)³ 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 (++)⁴ 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 (+)¹ and one (+)² 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 (+)^{3,4} 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 (-)¹ 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 (+)² 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 (++)¹ 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 +)^{2,3,4,5} 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 (+)^{6,7} 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 (+)⁸ cohort study found that pro-tobacco media increased susceptibility to smoking, while anti-tobacco media decreased susceptibility. Conversely, one (++)⁹ 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 +)^{1,2,3,4} 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 (+)¹ 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 (+)² cohort study found that over time, boys were more susceptible (expressed greater interest in smoking uptake) to smoking than girls. One (+)³ cross-sectional study found no gender differences in the effectiveness of an anti-smoking campaign. A cross-sectional (-)⁴ study found that while awareness was similar for girls and boys, girls had a greater recall of anti-tobacco messaging. In a (+)⁵ 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 (+)¹, one US-based cohort study (+)², and three cross-sectional (one++, one +, and one-)^{3,4,5} 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 (+)⁶ 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 (+)⁷ found that older youth demonstrated greater change in behavioural intentions after exposure to a media campaign. As well, one cross-sectional (+)⁸ study testing emotional reactions to smoking ads, only found a weak relationship between age and response.

Evidence from one RCT study (+)⁹ 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 (+)¹⁰ 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 (++)¹ 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 (+)² study found no relationship between ethnicity and emotional reaction to anti-smoking messages. Finally, one (+)³ 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 (+)¹ 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 (+)² 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 (+)^{1,2} 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 Fichtenburg 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 (–)¹ 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 (+)¹ 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 (+)² 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 (++)¹ Cochrane review and one US- based cross-sectional study (+)² 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 (+)³ and 2 cross sectional studies (-)^{4, 5} as an important part of multi-component interventions. Evidence from one review (+)⁶ 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 (+)^{1,2} 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 (+)³ 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 (+)¹, 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 (+)² non-RCT and two cross-sectional (+)^{3,4} 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 (+)¹ 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 (++)² 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 (+)^{3,4} 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 (+)^{1,2} 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 (+)⁴ 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 (+)⁴ 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 (++)¹ Cochrane review and 1 cross sectional (++)² 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 (–)³ 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 (+)⁴ cross sectional study and a (+)⁵ 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 (+)^{6,7} 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 (++)¹ 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 (+)^{2,3} 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 (+)⁴ cross sectional study suggests girls are more successful in buying tobacco and one (+)⁵ 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 (+)¹ 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 (+)² 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 (+)^{1,2,3} reviews and one (++)⁴ 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 (+)⁵ 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.

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