National Institute for Health and Care Excellence

Draft for Consultation

Tobacco: preventing uptake, promoting quitting and treating dependence: update

[A] and [B] Evidence reviews for mass media and prevention

NICE guideline <number>

Evidence reviews

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Draft for Consultation

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Review questions

This evidence report covers two review questions, each with two parts:

A. Which campaigns delivered through digital mass media and mobile phone applications are effective and cost effective in preventing children, young people and young adults from taking up smoking?

A. Do these interventions change children, young people and young adults' perceptions of the social acceptability of smoking or people who smoke? In what way, and what aspects of interventions are perceived as having caused the change?

B. Are smoking cessation campaigns delivered through mass media and mobile phone applications aimed at adults effective and cost effective in preventing uptake of smoking among children, young people and young adults?

B. Do these interventions change children, young people and young adults' perceptions of the social acceptability of smoking or people who smoke? In what way, and what aspects of interventions are perceived as having caused the change?

Digital mass media and mobile phone applications for preventing uptake of smoking

Review question

Which campaigns delivered through digital mass media and mobile phone applications are effective and cost effective in preventing children, young people and young adults from taking up smoking[a]?

Do these interventions change children, young people and young adults' perceptions of the social acceptability of smoking or people who smoke? In what way, and what aspects of interventions are perceived as having caused the change?

Introduction

Most adults who smoke habitually began smoking at a young age, so preventing uptake among children, young people and young adults is important to reduce population harm.

Digital media, in particular social media, form a part of the communication and information landscape for many people, and they offer opportunities to target messages to particular groups. Their effectiveness and cost effectiveness for preventing uptake of smoking should be determined. This review aims to identify which campaigns delivered through digital mass media and mobile phone applications ('apps') can help prevent young people from taking up smoking.

Table 1: PICO inclusion criteria: digital mass media and mobile phone apps for preventing uptake of smoking

Population	Children, young people and young adults[b] who do not smoke and have never smoked habitually
Interventions	Campaigns delivered through digital mass media, including social media, or apps which have a stated and measured aim of preventing children and young people from taking up smoking. Digital mass media are forms of mass media that are technology-based and might also be interactive. They can reach large numbers of people and do not involve person to person contact. For example: • Social media: for example, Twitter and Facebook • Content sharing sites: for example, YouTube, Instagram and blogs • Interactive channels: for example, web-based games • Digital communication channels: for example, e-mail, web-based adverts, Snapchat • Mobile app versions of the above.

[a] Throughout, smoking refers to the use of all smoked tobacco products. 'Smoking' or 'smoking habitually' refers, unless specifically stated otherwise, to people who smoke weekly or more often. Smoking experimentally is defined as smoking less than weekly.

[b] For the purposes of this guidance, children are aged 5-11, young people are 12-17 and young adults are 18-24 inclusive.

	Apps accessed on mobile phones or tablets which are wholly or partly purpose built to prevent smoking uptake will also be included. Campaigns may be of any duration and frequency. Studies where the only difference between intervention and control is a digital mass media or app component will also be included. **Excluded**: Mass media interventions using traditional mass media (for example, television, radio and printed media) or digital media which has been previously examined (text messaging). Individual-level technology such as wearable devices. Interventions delivered through digital mass media which are not campaigns, for example online counselling. Interventions in which digital mass media is not a core component or for which results for digital mass media elements alone are not presented. Interventions solely to prevent the uptake of other types of tobacco use (chewed or smokeless tobacco, for example). Interventions to encourage or support children and young people to quit smoking.
Comparator	No intervention. Another mass media intervention (via digital media or other mass media). Interventions with no mass media component (e.g. school-based educational interventions; counselling; usual curriculum).

Outcomes	**Quantitative outcomes**
	
	Smoking status is the key outcome for this review.
	
	<u>Critical outcome</u>
	
	• Smoking status at longest available follow-up. Measured as:
	  – Relative risk of smoking habitually
	  – Relative risk of smoking experimentally (less often than habitually)
	
	Where biochemically validated measures are available, these will be preferred to self-reported measures.
	
	<u>Important outcomes</u>
	
	Children and young people's:
	
	• Knowledge of smoking harms (only extracted if another outcome reported, as a potential mediator of the effect)
	• Attitude towards smoking (including intention to smoke)
	• Health-related quality of life (using validated patient-report measures, for example EQ-5D)

- Adverse or unintended (positive or negative) effects. For example:
  - incorrect health perceptions or health anxiety
  - experimentation or intention to experiment with smoking triggered by intervention

Qualitative outcomes

For digital mass media or app-based prevention interventions aimed at children, young people and young adults, participant views will be examined on perceptions of social acceptability of smoking, any impact of the intervention on these perceptions, and information on what aspects of the intervention caused the response (content, mode etc.)

Acceptability, and barriers and facilitators to uptake of the intervention will not be investigated for this review question as digital mass media generally do not require active uptake and are instead part of an individual's environment.

Cost/resource use associated with the intervention

The following outcomes will be extracted in reviews of the health economic evidence, where available:

- cost per quality-adjusted life year
- cost per unit of effect
- net benefit
- net present value
- cost/resource impact or use associated with the intervention or its components

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual (2018). Methods specific to this review question are described in the review protocol in Appendix A. See the methods chapter for additional information on methods for the Tobacco guideline.

Declarations of interest were recorded according to NICE's 2018 conflicts of interest policy.

A change was made to the protocol for this review. The protocol specified that studies published in or since 1998 would be included. However, digital interventions are rapidly developing, so in order to ensure included studies are as relevant as possible, only studies published in or since 2007 were included. According to an Ofcom report, 2008 was a significant year for the emergence of mobile broadband, and market convergence identified in the use of internet for TV broadcasting and an increase in households purchasing complex bundled communication packages[c].

[c] Ofcom: *The Communications Market Report 2008, Recent major developments*. <https://webarchive.nationalarchives.gov.uk/20160703014921/http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr08/> Accessed 24 Apr 2019.

Identification of public health evidence

Included studies

A joint search was used to identify relevant studies for review question A (digital mass media and apps) and review question B (cessation campaigns) combined. Although only studies published since 2008 were eligible for inclusion in review A as it is an update of a previous review question (which included 41 papers on mass media), the joint search included all studies published since 1998 as review question B is a new review and therefore any studies from the past 20 years were eligible for inclusion. The joint systematic search was undertaken in October 2018 for studies published in the English language. A top-up was done for studies about people aged 5-11 years. Website searches were conducted in line with the protocol. Further details on the search strategy are available in Appendix B.

After removal of duplicates, 10,992 unique database results were identified. The website searches identified a further 41 results that were screened separately. As there was a large number of unique database results, the EPPI-Reviewer priority sifting function was used. Stopping thresholds were defined in advance:

- At least 50% of the total identified abstracts sifted AND
- At least 10% of the total identified abstracts had been sifted without identifying a potential include

In total, 5,767 items were sifted with the final 1,641 (15% of the total identified abstracts) sifted without identifying a potential include. This met requirements for stopping, so the remaining items were not sifted.

72 articles were ordered for full-text review. Two of these were included for review A, and one for review B. No previous includes from the original review were included as they were published previous to 2008.

Of the two included studies for review A, one is a cluster randomised controlled trial (cRCT) and one is a qualitative study.

Excluded studies

Of the 72 articles from the new search with potential to answer review questions A or B, 69 were excluded from both reviews (two were included in review A, and one in review B). See Appendix K for a full list of excluded studies and the reasons for exclusion.

Table 2: Summary of public health studies included in the evidence review

Study	Setting	Population	Intervention	Comparator	Outcome(s)
Cremers 2015 Cluster RCT	Netherlands Primary schools across the country: 59 schools in intervention plus prompt; 51 in intervention and 52 in control.	Students at the schools, age 11-13. 1207 children in intervention plus prompt, 1003 in intervention, 1003 in control at baseline.	Fun without smokes Website with interactive non-smoking content (games, animation). Prompt group also received email and SMS reminders to visit the website.	No intervention	• Non-smokers taking up smoking • Intention to smoke

Study	Setting	Population	Intervention	Comparator	Outcome(s)
Struik 2012 Qualitative study	Canada, British Columbia Community setting	Young women aged between 15-18 who use social media. 17 young women aged 16-19 across 3 focus groups. Mix of smokers and non-smokers.	Seven visual messages used online by various organisations, targeted specifically at young women.	NA	Themes around targeted messaging for young women and internet as a channel for smoking prevention mass-media campaigns.

See Appendix D for full evidence tables.

Synthesis and appraisal of public health studies included in the evidence review

Evidence appraisal

- This review addresses an intervention question. Randomised controlled trial (RCT) evidence was therefore assessed using Cochrane's *Risk of Bias 2.0* tool, and all other quantitative study designs using the *Risk of Bias in Non-Randomised Studies – of Interventions* (ROBINS-I) tool, according to the NICE Manual.
- All GRADE ratings start at 'high' and are downgraded as appropriate.
- All qualitative studies were assessed using the CASP checklist and confidence was assessed using GRADE CERQual.

See Appendix F for full GRADE and GRADE CERQual tables.

See Methods document for details of rationale for GRADE judgements.

Table 3: Minimal Important Differences (MIDs) agreed

Review	Outcome	Importance	MID
A and B	Smoking status	Critical	Statistical significance
A and B	Attitude towards smoking, including intention to smoke	Important	Statistical significance
A and B	Knowledge of smoking harms	Important	5% increase or decrease (RR0.95, 1.05) Where reported as a continuous outcome, default MID will be applied*
A and B	Self-efficacy	Important	5% increase or decrease (RR0.95, 1.05) Where reported as a continuous outcome, default MID will be applied*

*Default MID for continuous outcomes is any change.

Economic evidence

Included studies

A joint search was used to identify relevant studies for the cost effectiveness elements of review questions A (digital mass media and apps), B (cessation campaigns), C (proxy sales), D (illicit supply) and E (smokefree class competitions) combined. This search incorporated the search strategies of the original effectiveness searches plus the top-up searches and then applied an agreed cost effectiveness filter.

The joint systematic search was undertaken in January 2019 for studies published in the English language from 1998-29 January 2019. After removal of duplicates 3110 unique results were identified. A further 4 results were identified from other sources.

3,114 records were assessed against the eligibility criteria.

2,984 records were excluded based on information in the title and abstract. One reviewer assessed all of the records and a second reviewer blind-screened 10% of the records. The level of agreement between the two reviewers was 100%.

The full-text papers of 130 documents were retrieved and assessed and 0 studies were assessed as meeting the eligibility criteria for research question A.i. or A.ii. One reviewer assessed all of the full texts and a second reviewer blind-screened 10% of the records. The level of agreement between the two reviewers was 100%. For review questions A.i. and A.ii. no studies were included.

Excluded studies

130 full text documents were excluded for these review questions. The documents and the reasons for their exclusion are listed in Appendix K – Excluded studies. Documents were excluded for the following reasons: ineligible intervention (n=76), ineligible outcomes (n=22), ineligible study design (n=18), ineligible patient population (n=13) and non-English language (n=1). The selection process is shown in Appendix G

Summary of studies included in the economic evidence review

No studies were included for review questions A.i. and A.ii.

Economic model

Due to the paucity and quality of effectiveness evidence these review questions were not prioritised for economic modelling.

Resource impact

No new recommendations were made, so no resource impact is expected.

Summary of the evidence

This table is a very high-level overview of the results presented in the GRADE tables and links to qualitative review findings. These results should not be considered apart from the GRADE and GRADE CERQual tables, which contain more information about confidence in the evidence and limitations (Appendix F).

Table 4: Evidence summary

Outcome	Summary	Confidence	GRADE profile	Linking qualitative review findings
Non-smokers taking up smoking	The intervention could not differentiate between comparators (Cremers 2015)	Low	1	See appendix F matrix of integration
Intention to smoke	The intervention could not differentiate between comparators (Cremers 2015)	Low	2	
Perspectives on use of social media to deliver tobacco control messages (15-18years)	• Importance of interactivity. • Uncomfortable with the sexualisation of women and mixed views on the use of the negative impact of smoking on appearance. • Preference for positive message framing. • Consideration of the trust of information on the internet.	Low	CERQual tables	

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The committee agreed that smoking status was the most important outcome to reflect long-term health. Smoking status at a minimum of 1-year post-baseline was chosen to align with thinking in the field of behaviour change. Time is required to allow the spread and absorption of a digital mass media intervention, as well as to allow time for the behaviour (smoking) to be prevented.

The protocol also included outcomes on knowledge about smoking harms and attitudes towards smoking. These outcomes were important rather than critical because, although they may be associated with smoking status, they are a proxy measure.

Confidence in the evidence

The committee decided that there was not enough evidence (one quantitative and one qualitative study), and the available evidence was too uncertain, to make recommendations.

Quantitative evidence

The committee agreed that risk of bias was serious. Attrition was high overall, and higher in the intervention groups, which could have changed the composition of the group completing the intervention.

There was no serious indirectness. However, the committee noted that there are constant developments in digital mass media and the technologies that exist to make campaigns widely available. Because of this, the intervention in the study (a website) is one of many technologies currently available and may be superseded by other technologies, meaning it could become out of date.

The committee noted that all the effects were imprecise, and that the intervention groups had results for smoking and intention to smoke which were not significantly different from the

control group. The intervention plus prompt group, which received emails and texts reminding users to access the intervention website, had a lower risk of smoking and lower risk of intending to smoke when compared with the control group than the intervention without prompt group did. Confidence intervals overlapped indicating that these differences were not significant.

Overall, confidence in the evidence about uptake of smoking and intention to smoke was low, when comparing either the prompt group or the no prompt group to control.

Qualitative evidence

The main concerns shared by the committee were around adequacy and relevance. Although the data for findings 1 to 3 (about interactivity, portrayal of women and fear-based messaging) had somewhat rich data, this only came from one study with a partially relevant sample. Concerns about relevance stemmed from the fact that the study was only partially relevant: it included young women aged 16 to 19, meaning that no evidence was available for other sexes or age groups. Confidence in review finding 4 is very low because of thin, sparse data. Overall, the qualitative evidence was of low to very low confidence.

There was not much opportunity to use qualitative data to explore the quantitative findings due in part to the uncertainty of the quantitative findings, and in part to the lack of overlap in the population of the quantitative study (school children aged 11-13) and the qualitative study (young women age 16-18 in the general community).

Benefits and harms

The committee agreed that there was no evidence reported in the included studies of any harms resulting from digital mass media campaigns to prevent uptake of smoking.

Due to the way in which digital mass media campaigns are designed to reach large numbers of people without requiring face to face or individual contact, even small individual benefits could result in large benefits at a population level. However, there is a lack of evidence about effectiveness of digital mass media campaigns with follow-up periods long enough to allow spread of the campaign and to measure prevention with any reliability. The committee considered that with the lack of evidence they could not recommend the interventions.

Cost effectiveness and resource use

No cost effectiveness studies were identified and the effectiveness evidence was considered by the committee to be too sparse and of insufficient quality to inform any economic modelling. Digital mass media campaigns may require fewer resources, compared with other interventions, to reach the same number of people. They may also have wide reach, as discussed above. The lack of effectiveness information made any further consideration of cost effectiveness difficult.

Other factors the committee took into account

The committee discussed the difficulty of conducting research in this area. Digital interventions are constantly evolving, and the way in which they are used by their intended audience is evolving as well. Conducting long-term research on the effect of a particular intervention is therefore difficult and may not be useful by the time it is complete. This could partly explain the lack of published evidence. The committee agreed that careful thought was required by those in the field to determine the best methodologies to investigate this area. The committee discussed the possibility of making research recommendations in this area. They agreed that this is not a current priority for research. They further discussed that with the decreasing rates of smoking that in future approaches to smoking cessation campaigns may become much more targeted to individuals and groups where the prevalence of smoking has remained high or where rates are decreasing more slowly.

The committee also pointed out that the absence of evidence does not equate to the absence of effect. They did not, therefore, want to recommend against using digital mass media campaigns. However, they chose not to make new recommendations about using digital mass media to prevent the uptake of smoking, or to add in specifics about digital mass media to the recommendations which had been brought forward from *PH14 Smoking: Preventing uptake in children and young people* about mass media campaigns for preventing uptake of smoking. They did choose to make some of the language around mass media more inclusive, rather than specifying traditional methods, in recognition that digital methods may be used alone or in combination with other methods.

Recommendations supported by this evidence review

No recommendations were made from this evidence review.

Included study list

Cremers H. P., Mercken L., Candel M. *et al.* 2015. A web-based, computer-tailored smoking prevention program to prevent children from starting to smoke after transferring to secondary school: randomised controlled trial. *Journal of Medical Internet Research,* 17(3): e59.

Struik, L. L., Bottorff L. J., Jung M., Budgen C., 2012. Reaching adolescent girls through social networking: A new avenue for smoking prevention messages. Canadian Journal of Nursing Research 44 (3): 84-103.

Mass media cessation campaigns for preventing uptake of smoking

Review question

Are smoking cessation campaigns delivered through mass media and mobile phone applications aimed at adults effective and cost effective in preventing uptake of smoking[d] among children, young people and young adults?

Do these interventions change children, young people and young adults' perceptions of the social acceptability of smoking or people who smoke? In what way, and what aspects of interventions are perceived as having caused the change?

Introduction

The Department of Health and Social Care's tobacco control plan (2017) notes the influence of adult role models, and hence the importance of supporting adults who smoke habitually to quit in order to prevent uptake of smoking. Increasing cessation could create an environment where smoking cigarettes is not seen as normal or acceptable, through 'denormalisation'. It is important to ascertain whether smoking cessation mass media campaigns and mobile phone applications ('apps') for adults contribute to denormalising smoking and therefore potentially prevent the uptake of smoking in children, young people and young adults.

Table 5: PICO inclusion criteria: mass media cessation campaigns for preventing uptake of smoking

Population	Children, young people and young adults[e] who do not smoke and have never smoked habitually.
Interventions	Campaigns delivered through mass media or mobile apps which have a stated and measured aim of increasing smoking cessation in adults aged 18 and over. Mass media interventions have been defined as programmes or campaigns aimed at reaching large numbers of people via television, internet, radio, print media and digital media. Mass media interventions do not necessarily involve person to person contact but are often population level or population group level. Delivery of campaigns may be via: • Digital media, for example social media, content sharing sites, interactive channels and digital communication channels • Text messaging • Television and radio • Newspapers • Posters, leaflets or booklets

[d] Throughout, smoking refers to the use of all smoked tobacco products. 'Smoking' or 'smoking habitually' refers, unless specifically stated otherwise, to people who smoke weekly or more often. Smoking experimentally is defined as smoking less than weekly.

[e] For the purposes of this guidance, children are aged 5-11 and young people are 12-17 and young adults are 18-24 inclusive.

	• Community interventions where the major component is mass media. Apps accessed on mobile phones or tablets which are wholly or partly purpose built for smoking cessation will also be included. Campaigns may be of any duration and frequency. Studies where the only difference between intervention and control is a mass media or app component will also be included. **Excluded**: Interventions in which mass media is not a core component or for which results for mass media elements alone are not presented. Individual-level technology such as wearable devices. Interventions delivered through mass media which are not campaigns, for example online counselling. Interventions aimed at children and young people, including interventions to encourage or support children and young people to quit smoking. Interventions to prevent the uptake of tobacco.
Comparator	• No intervention. • Another mass media intervention • Interventions with no mass media component (e.g. school-based educational interventions; counselling; usual curriculum).
Outcomes	**Quantitative outcomes** Smoking status is the key outcome for this review. <u>Critical outcome</u> • Smoking status of children, young people and young adults at longest available follow-up. Measured as: – Relative risk of smoking habitually – Relative risk of smoking experimentally (less often than habitually) Where biochemically validated measures are available, these will be preferred to self-reported measures. <u>Important outcomes</u> Children and young people's: • Knowledge of smoking harms (only extracted if another outcome reported, as a potential mediator of the effect) • Attitude towards smoking (including intention to smoke) • Health-related quality of life (using validated patient-report measures, for example EQ-5D)

- Adverse or unintended (positive or negative) effects. For example:
  - incorrect health perceptions or health anxiety
  - experimentation or intention to experiment with smoking triggered by intervention

Qualitative outcomes

For mass media or app-based cessation interventions aimed at adults, views of children, young people and young adults will be examined on perceptions of social acceptability of smoking, any impact of the intervention on these perceptions, and information on what aspects of the intervention caused the response (content, mode etc.).

Barriers and facilitators to uptake of the intervention will not be investigated for this review question as mass media generally do not require active uptake and are instead part of an individual's environment.

Cost/resource use associated with the intervention

The following outcomes will be extracted in reviews of the health economic evidence, where available:

- cost per quality-adjusted life year
- cost per unit of effect
- net benefit
- net present value
- cost/resource impact or use associated with the intervention or its components

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in Appendix A.

Declarations of interest were recorded according to NICE's 2018 conflicts of interest policy.

See the methods chapter for additional information on methods for the Tobacco guideline.

Identification of public health evidence

Included studies

See 'Identification of public health evidence' for review A for full information.

One study is included in review B. The included study is an RCT; no qualitative studies were identified for this review.

Excluded studies

Of the 72 articles from the new search with potential to answer review questions A or B, 69 were excluded from both reviews (two were included in review A, and one in review B). See Appendix K for a full list of excluded studies and the reasons for exclusion.

Table 6:Summary of public health studies included in the evidence review

Study	Setting	Population	Intervention	Comparator	Outcome(s)
Schuck 2015 RCT	Netherlands, countrywide.	Parent-child pairs recruited through primary schools. 256 pairs in intervention and control groups.	40-page self-help brochure to encourage smoking cessation	Telephone counselling and three supplementary brochures	• Children's smoking initiation • Children's perceived safety of smoking • Children's self-efficacy • Children's susceptibility to smoking

See Appendix D for full evidence tables.

Synthesis and appraisal of public health studies included in the evidence review

See Appendix F for full GRADE tables. See 'Synthesis and appraisal of public health studies included in the evidence review' for review A for more information.

Economic evidence

Included studies

See "Economic Evidence" for review question A for full information.

No studies were included for review question B.

Excluded studies

130 full text documents were excluded for these review questions. The documents and the reasons for their exclusion are listed in Appendix K – Excluded studies. Documents were excluded for the following reasons: ineligible intervention (n=76), ineligible outcomes (n=22), ineligible study design (n=18), ineligible patient population (n=13) and non-English language (n=1). The selection process is shown in Appendix G

Summary of studies included in the economic evidence review

No studies were included for review question B.

Economic model

Due to the paucity and quality of effectiveness evidence these review questions were not prioritised for economic modelling.

Resource impact

No new recommendations were made, so no resource impact is expected.

Summary of the evidence

This table is a very high-level overview of the results presented in the GRADE tables. These results should not be considered apart from the GRADE tables, which contain more information about confidence in the evidence and limitations.

Table 7: Evidence summary

Outcome	Summary	Confidence	GRADE profile
Smoking initiation among children	The intervention could not differentiate between comparators (either for intervention group vs control group, or for children of parents who quit vs children of parents who did not quit) (Schuck 2015)	Low	3
Children's perceived safety of smoking	Self-help brochure vs telephone counselling: The intervention could not differentiate between comparators (Schuck 2015)	Low	4
Children's self-efficacy to refuse cigarettes	Self-help brochure vs telephone counselling: The intervention could not differentiate between comparators (Schuck 2015)	Low	5
Children's susceptibility to smoking	Self-help brochure vs telephone counselling: The intervention could not differentiate between comparators (Schuck 2015)	Low	6

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The committee agreed that smoking status among children, young people and young adults was the most important outcome to judge smoking prevention, and therefore to reflect long-term health.

The protocol also included outcomes on knowledge about smoking harms and attitudes towards smoking. These outcomes were important rather than critical because, although they may be associated with smoking status, they are a proxy measure.

Confidence in the evidence

The committee agreed that the evidence was uncertain. Smoking initiation was lower among children of those given the self-help brochure (intervention group), and among children of parents who had quit as part of the cessation intervention, but the results were not significant. Children's knowledge of smoking harms, self-efficacy and susceptibility to smoking were also improved in the intervention group, but not significantly.

The committee discussed some concerns about the risk of bias of the study which were considered to be serious: attrition could have introduced bias as the outcome was rare, and the result was self-reported which could introduce desirability bias, and it is unclear whether children's responses might have been visible to or influenced by parents. Confidence in all of the outcomes for this review was low.

Benefits and harms

The committee did not identify any harms or benefits related to the intervention.

Cost effectiveness and resource use

No cost effectiveness data was identified for this review. The committee considered the effectiveness evidence too limited to inform any economic modelling.

Other factors the committee took into account

The committee noted that the comparator was an active intervention - a course of telephone counselling. They agreed that the evidence showing that effectiveness was not significantly different for a less intensive intervention (self-help brochure) compared with a more intensive one (telephone counselling) was not a comparison that enabled them to recommend the intervention.

The committee also noted that this review considered the possible benefit of cessation interventions for prevention, and therefore did not evaluate the effectiveness of cessation mass media interventions for their main outcome (stopping smoking). Their choice not to make recommendations was a reflection of the lack of evidence about how these interventions prevent uptake: despite this they may still be of benefit for cessation, and the NICE Tobacco Update does include recommendations about mass media interventions for promoting quitting.

The committee discussed the possibility of making research recommendations in this area. They agreed that this is not a current priority for research. They further discussed that with the decreasing rates of smoking that in future approaches to smoking cessation campaigns may become much more targeted to individuals and groups where the prevalence of smoking has remained high or where rates are decreasing more slowly.

Recommendations supported by this evidence review

No recommendations were made from this evidence review.

Included study list

Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. *Addictive behaviours* 40: 66-72.

Appendices

Appendix A – Review protocols

Review protocol for review A Digital mass media and mobile phone applications for preventing uptake of smoking

ID	Field (based on PRISMA-P	Content
I	Review question	1.1a. Which campaigns delivered through digital mass media and mobile phone applications are effective and cost effective in preventing children, young people and young adults from taking up smoking[6]? 1.1b. Do these interventions change children, young people and young adults' perceptions of the social acceptability of smoking or people who smoke? In what way, and what aspects of interventions are perceived as having caused the change?
II	Type of review question	Mixed methods
III	Objective of the review	Most adults who smoke habitually began smoking at a young age. This review aims to identify which campaigns delivered through digital mass media and mobile phone applications ('apps') can help prevent young people from taking up smoking.
IV	Eligibility criteria – population/disease/condition/issue/domain	**Included**: Children, young people and young adults[7] who do not smoke and have never smoked habitually.

[6] Throughout, smoking refers to the use of all smoked tobacco products. 'Smoking' or 'smoking habitually' refers, unless specifically stated otherwise, to people who smoke weekly or more often. Smoking experimentally is defined as smoking less than weekly.

[7] For the purposes of this guidance, children are aged 5-11, young people are 12-17 and young adults are 18-24 inclusive.

		Excluded: People aged 25 or over. Children and young people who smoke or have ever smoked habitually. **Settings:** Online and digital settings, including social media.
V	Eligibility criteria – intervention(s)/exposure(s)/prognostic factor(s)	**Included**: Campaigns delivered through digital mass media, including social media, or apps which have a stated and measured aim of preventing children and young people from taking up smoking. Digital mass media are forms of mass media that are technology-based and (might also be) interactive. They can reach large numbers of people and do not involve person to person contact. For example: • Social media: for example Twitter and Facebook • Content sharing sites: for example YouTube, Instagram and blogs • Interactive channels: for example web-based games • Digital communication channels: for example e-mail, web-based adverts, Snapchat • Mobile app versions of the above. Apps accessed on mobile phones or tablets which are wholly or partly purpose built to prevent smoking uptake will also be included.

		Campaigns may be of any duration and frequency. Studies where the only difference between intervention and control is a digital mass media or app component will also be included. **Excluded**: Mass media interventions using traditional mass media (for example, television, radio and printed media) or digital media which has been previously examined (text messaging). Individual-level technology such as wearable devices. Interventions delivered through digital mass media which are not campaigns, for example online counselling. Interventions in which digital mass media is not a core component or for which results for digital mass media elements alone are not presented. Interventions solely to prevent the uptake of other types of tobacco use (chewed or smokeless tobacco, for example). Interventions to encourage or support children and young people to quit smoking.
VI	Eligibility criteria – comparator(s)/control or reference (gold) standard	**Included**: • No intervention. • Another mass media intervention (via digital media or other mass media). • Interventions with no mass media component (e.g. school-based educational interventions; counselling; usual curriculum).
VII	Outcomes and prioritisation	**Quantitative outcomes (1.1a)**

		Smoking status is the key outcome for this review.
		
		<u>Critical outcome</u>
		
		• Smoking status at longest available follow-up. Measured as:
		  – Relative risk of smoking habitually
		  – Relative risk of smoking experimentally (less often than habitually)
		
		Where biochemically validated measures are available, these will be preferred to self-reported measures.
		
		Trials where interventions are allocated by cluster and analysis is at the individual level are vulnerable to unit of analysis error. To mitigate for this, studies should correct for clustering. If no adjustment has been carried out, the review team will adjust the effect estimates by inflating standard errors, as described in the Cochrane manual.
		
		<u>Important outcomes</u>
		
		Children and young people's:
		
		• Knowledge of smoking harms (only extracted if another outcome reported, as a potential mediator of the effect)
		• Attitude towards smoking (including intention to smoke)
		• Health-related quality of life (using validated patient-report measures, for example EQ-5D)
		• Adverse or unintended (positive or negative) effects. For example:
		  – incorrect health perceptions or health anxiety

		– experimentation or intention to experiment with smoking triggered by intervention **Qualitative outcomes (1.1b)** For digital mass media or app-based prevention interventions aimed at children, young people and young adults, participant views will be examined on perceptions of social acceptability of smoking, any impact of the intervention on these perceptions, and information on what aspects of the intervention caused the response (content, mode etc.) Acceptability, and barriers and facilitators to uptake of the intervention will not be investigated for this review question as digital mass media generally do not require active uptake and are instead part of an individual's environment. **Cost/resource use associated with the intervention** The following outcomes will be extracted in reviews of the health economic evidence, where available: • cost per quality-adjusted life year • cost per unit of effect • net benefit • net present value • cost/resource impact or use associated with the intervention or its components
VIII	Eligibility criteria – study design	**Included study designs**:

		• Systematic reviews of included study designs • RCTs (including cluster RCTs) • Non-randomised controlled trials • Controlled before-and-after studies • Interrupted time series <u>Qualitative studies:</u> • Focus groups, interview-based studies or surveys with open-ended responses. Must be related to an eligible intervention. <u>Economic studies</u>: • Cost-utility (cost per QALY) • Cost benefit (i.e. net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimization • Cost-consequence **Excluded study designs**: • Longitudinal cohort and uncontrolled ‘before-and-after’ intervention studies • Cross-sectional surveys • Correlation studies

		• Case control studies
IX	Other inclusion exclusion criteria	**Studies** As this is an update of existing guidance (PH14), studies included in the original evidence reviews which support the recommendations that are being updated will be assessed against the updated inclusion / exclusion criteria specified in this protocol. Studies will be excluded if they do not meet the updated inclusion criteria. **Exclusion criteria (1.1a)** • Studies with less than 1 year between baseline measurement and follow-up measurement. • Mixed populations (for example, study samples that also include people 25 and over or also include people who smoke, with insufficient disaggregation to enable data relevant to this review to be extracted). Only papers published in the English language will be included. Only studies carried out in OECD countries will be included (for effectiveness data) and in the UK (for qualitative data). Only studies published in 2007 onwards will be included; these will be included alongside any studies from the original PH14 review which meet the inclusion criteria in this protocol, and are published since 1998. (Searches will be run from 1998 to incorporate the new review question 1.2 results.) Only full published studies (not protocols or summaries even where they include some data) will be included. **Systematic reviews**

		Relevant systematic reviews (SRs) identified from database searches will be citation searched. Highly relevant systematic reviews may be included as a primary source of data. These SRs will be assessed against the inclusion criteria for this protocol, and their quality will be assessed using the ROBIS tool. Where the SR is highly relevant and of high quality, details or data from the systematic review may be used. In addition to any SRs meeting the above criteria, other primary studies will be included if they were published after the publication date of the SR and meet the protocol inclusion criteria. Full economic analyses and costing studies identified from searches will be included. Costing data will not be used for the purpose of the effectiveness review. Health economics reviews and modelling will be conducted by the York Health Economics Consortium (YHEC).

X	Proposed sensitivity/sub-group analysis, or meta-regression	The following factors will be of interest in any subgroup or meta-regression analyses:
		
		• Mode of delivery
		  ○ single mode vs multi-mode
		• Message framing
		  ○ emphasis on harms of smoking vs benefits of being smoke-free
		• Age of target population
		  ○ children and young people 17 years old and under compared with young adults 18-24 years old
		• Campaign organisers
		  ○ Tobacco organisation-funded interventions vs others
		
		Components of apps which are of interest may include:
		
		• Target audience
		• Intervention intensity

		• App design (e.g. user-friendliness)
XI	Selection process – duplicate screening/selection/analysis	The review will use the priority screening function within the EPPI-reviewer systematic reviewing software. Double screening will be carried out for 10% of titles and abstracts by a second reviewer. Disagreements will be resolved by discussion. Inter-rater reliability will be assessed and reported. If below 90%, a second round of 10% double screening will be considered. The study inclusion and exclusion lists will be checked with members of the PHAC to ensure no studies are excluded inappropriately.
XII	Data management (software)	EPPI Reviewer will be used: • to store lists of citations • to sift studies based on title and abstract • to record decisions about full text papers • to order freely available papers via retrieval function • to request papers via NICE guideline Information Services • to store extracted data Cochrane Review Manager 5 will be used to perform meta-analyses. Any meta-regression analyses will be undertaken using the R software package. Qualitative data will be summarised using secondary thematic analysis. A matrix approach will be used to compare findings with quantitative evidence.
XIII	Information sources – databases and dates	The purpose of the search is to identify the best available evidence to address the questions without producing an unmanageable volume of results. The same search will be used to identify evidence for both RQ1.1 and RQ1.2.

		The following methods will be used to identify the evidence: • the databases listed below will be searched with an appropriate strategy. • the websites listed below will be searched or browsed with an appropriate strategy. • studies included in the evidence reviews for PH14 which support the recommendations that are being updated and potentially meet the criteria for the current review will be added to the search results. • studies included in the surveillance reviews for PH14 will be added to the search results. • selected studies that are potentially relevant to the current review will be identified from the bibliography of any systematic reviews identified during the search process that are not being included in their own right. • forward citation searching will be done using selected studies prioritised from the surveillance reviews, the studies included in PH14, scoping searches or any relevant systematic reviews identified in the search process. **Database strategies** The database strategy will be adapted as appropriate from the one used in PH14 in 2007, taking into account the resources available to this review, the subscriptions that NICE has, changes in indexing policies and the final scope for the current evidence reviews. The principal search strategy is listed in Appendix A. The search strategy will take this broad approach: (smoking OR tobacco OR cigarettes or shisha) AND (digital media or social media) AND (children OR young people OR young adults) AND 1998-Current AND Limits

		Feedback on the principal database strategy will be sought from PHAC members. The principal search strategy will be developed in MEDLINE (Ovid interface) and then adapted, as appropriate, for use in the other sources listed, taking into account their size, search functionality and subject coverage. The databases will be: • Applied Social Science Index and Abstracts (ASSIA) via ProQuest • Cochrane Central Register of Controlled Trials (CENTRAL) via Wiley • Cochrane Database of Systematic Reviews (CDSR) via Wiley • Embase via Ovid • Health Management Information Consortium (HMIC) via Ovid • MEDLINE via Ovid • MEDLINE-in-Process (including Epub Ahead-of-Print) via Ovid • PsycINFO via Ovid • Social Policy and Practice (SPP) via Ovid **Database search limits** Database functionality will be used, where available, to exclude: • non-English language papers • animal studies • editorials, letters and commentaries • conference abstracts and posters • registry entries for ongoing or unpublished clinical trials • duplicates. Sources will be searched from 1998 to current because the same strategy is being used for RQ1.1 and RQ1.2.

		The database search strategies will not use any search filters for specific study types. **Cost effectiveness evidence** A separate search will be done for cost effectiveness evidence. The following databases will be searched again with agreed study-type search filters applied to a strategy based on the one in Appendix A: • Embase via Ovid • MEDLINE via Ovid • MEDLINE-in-Process (including Epub Ahead-of-Print) via Ovid In addition, the following sources will be searched without study-type filters: • Campbell Collaboration via https://campbellcollaboration.org/library.html • • EconLit via Ovid • HTA database via CRD https://www.crd.york.ac.uk/CRDWeb/ • NHS EED via CRD https://www.crd.york.ac.uk/CRDWeb The main website results will be rescanned to check if there are any results potentially relevant to cost effectiveness. **Citation searching** Forward citation searching will be conducted using Web of Science (WOS). Only those references which NICE can access through its WOS subscription will be added to the search results. Only papers published in 1998-Current and in the English language will be included in the search results. Duplicates will be removed in WOS before downloading.

		Websites The following websites will be searched with an appropriate strategy: • Health Services/Technology Assessment Texts (HSTAT) https://www.ncbi.nlm.nih.gov/books/NBK16710 • NICE Evidence Search https://www.evidence.nhs.uk • Tobacco Control Database for the WHO European Region http://data.euro.who.int/tobacco The websites of relevant organisations, including the ones below, will be browsed: • Action on Smoking and Health (ASH) http://ash.org.uk/home • Center for Disease Control and Prevention (CDC) Media Campaign Resource Center (MCRC) https://www.cdc.gov/tobacco/multimedia/media-campaigns/index.htm • Fresh http://freshne.com/what-we-do/our-campaigns • Local Government Association https://www.local.gov.uk • National Centre for Smoking Cessation and Training http://www.ncsct.co.uk • Northern Ireland Assembly http://www.niassembly.gov.uk/ • Public Health England https://www.gov.uk/government/organisations/public-health-england • Royal College of Paediatrics and Child Health https://www.rcpch.ac.uk/ • Royal College of Physicians https://www.rcplondon.ac.uk • Scottish Government https://www.gov.scot • Smokefree NHS https://www.nhs.uk/smokefree • Smoking Toolkit Study http://www.smokinginengland.info • Treat Tobacco http://www.treatobacco.net/en/index.php • UK Centre for Tobacco and Alcohol Studies http://ukctas.net/index.html

		• University of Bath Tobacco Control Research Group https://researchportal.bath.ac.uk/en/organisations/uk-centre-for-tobacco-control-studies • University of Stirling Centre for Tobacco Control Research https://www.stir.ac.uk/about/faculties-and-services/health-sciences-sport/research/research-groups/centre-for-tobacco-control-research/publications • Welsh Government https://gov.wales/?lang=en The website results will be reviewed on screen and documents in English and published from 2007-Current that are potentially relevant to review question 1.1 or 1.2 will be listed with their title and abstract (if available) in a Word document. The initial screening decision will be made using this Word file. Any items selected for review at full text will be added to EPPI-Reviewer. **Quality assurance** The guidance Information Services team at NICE will quality assure the principal search strategy and peer review the strategies for the other databases. Any revisions or additional steps will be agreed by the review team before being implemented. Any deviations and a rationale for them will be recorded alongside the search strategies. **Search results** The database search results will be downloaded to EndNote before duplicates are removed using automated and manual processes. The de-duplicated file will be exported in RIS format for loading into EPPI-Reviewer for data screening.
XIV	Identify if an update	This question is an update of an existing question in PH14 [published July 2008].

		PH14 original RQ1 read: *Are mass media interventions effective in preventing the uptake of smoking in children and young people?* Searches for this question were conducted on 25 June 2007. Searches included multimedia, cell phone, advertising, communications media and internet, and will therefore have included any studies on digital media prior to June 2007.
XV	Author contacts	Please see the guideline development page.
XVI	Highlight if amendment to previous protocol	For details please see section 4.5 of Developing NICE guidelines: the manual
XVII	Search strategy – for one database	For details please see Appendix B
XVIII	Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as Appendix D (effectiveness evidence tables) or H (economic evidence tables).
XIX	Data items – define all variables to be collected	For details please see evidence tables in Appendix D (effectiveness evidence tables) or H (economic evidence tables).
XX	Methods for assessing bias at outcome/study level	Standard study checklists will be used to critically appraise individual studies. For details please see Appendix H of Developing NICE guidelines: the manual The risk of bias across all available evidence will be evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ GRADE will be used to assess confidence in the findings from quantitative evidence synthesis.

		GRADE-CERQual will be used to assess confidence in the findings from qualitative evidence syntheses.
XXI	Criteria for quantitative synthesis (where suitable)	For details please see section 6.4 of Developing NICE guidelines: the manual Non-randomised studies are at risk of confounding. These studies should adjust for confounders which are decided by the committee to have important potential to affect the result, or the allocation into intervention or control groups. These factors are: - Peer or family smoking - Baseline smoking status (where sample includes people who smoke) - Socioeconomic status Where adjusted results are provided, these will be used in analysis. Where no adjustment has taken place, this will be considered when assessing risk of bias.
XXII	Methods for analysis – combining studies and exploring (in)consistency	**Heterogeneity** Data from different studies will be pooled in a meta-analysis where they are investigating the same outcome and where the resulting meta-analysis may be useful for decision-making. Cluster and individual randomised controlled trials will be pooled. Randomised and non-randomised controlled studies investigating the same outcomes will be pooled. Results will be stratified by design (cluster, individual, randomised and non-randomised for a maximum of four groups stratified) and the P value of the interaction between study design and effect evaluated. A P value of <0.2 will be considered significant. If interaction is significant, results will be presented separately for each group, but if not, will be presented with one averaged effect estimate.

		It is anticipated that studies included in the review will be heterogeneous with respect to participants, interventions, comparators, setting and study design. Where significant between study heterogeneity in methodology, population, intervention or comparator is identified by the reviewer in advance of data analysis, random effects models will be used. If methodological heterogeneity is not identified in advance but the I2 value is ≥50%, random effects models will also be used. If the I^2 value is above 50%, heterogeneity will be judged to be serious and so will be downgraded by one level in GRADE. If the I^2 value is above 75%, heterogeneity will be judged to be very serious and will be downgraded by two levels in GRADE. If the studies are found to be too heterogeneous to be pooled statistically, a narrative synthesis will be conducted. **Imprecision** No minimally important difference (MID) thresholds relevant to this guideline were identified from the COMET database or other published source. MIDs were agreed by committee. Uncertainty is introduced where confidence intervals cross the MID threshold. If the confidence interval crosses one lower MID threshold, this indicates 'serious' risk of imprecision. Crossing both MID thresholds indicates 'very serious' risk of imprecision in the effect estimate. Where the MID is 'any significant change' there is effectively only one threshold (the line of no effect), and so only one opportunity for downgrading. In this instance, outcomes will be downgraded again if they are based on small samples (<300 people). MIDs for outcomes will be included in the methods section of the individual reviews.

XXIII	Meta-bias assessment – publication bias, selective reporting bias	For details please see Appendix H of Developing NICE guidelines: the manual.
XXIV	Assessment of confidence in cumulative evidence	For details please see sections 6.4 and 9.1 of Developing NICE guidelines: the manual.
XXV	Rationale/context – Current management	For details please see the introduction to the evidence review.
XXVI	Describe contributions of authors and guarantor	A multidisciplinary committee will develop the guideline. The committee will be convened by Public Health Internal Guidelines Development (PH-IGD) team and chaired by Sharon Hopkins in line with section 3 of Developing NICE guidelines: the manual. Staff from Public Health Internal Guidelines Development team will undertake systematic literature searches, appraise the evidence, conduct meta-analysis where appropriate and draft the guideline in collaboration with the committee. Cost-effectiveness analysis will be conducted by YHEC where appropriate. For details please see Developing NICE guidelines: the manual.
XXVII	Sources of funding/support	PH-IGD is funded and hosted by NICE
XXVIII	Name of sponsor	PH-IGD is funded and hosted by NICE
XXIX	Roles of sponsor	NICE funds PH-IGD to develop guidelines for those working in the NHS, public health and social care in England.
XXX	PROSPERO registration number	Not applicable

Review protocol for review B Mass media cessation campaigns for preventing uptake of smoking

ID	Field (based on PRISMA-P	Content
I	Review question	1.2a. Are smoking cessation campaigns delivered through mass media and mobile phone applications aimed at adults effective and cost effective in preventing uptake of smoking[8] among children, young people and young adults? 1.2b. Do these interventions change children, young people and young adults' perceptions of the social acceptability of smoking or people who smoke? In what way, and what aspects of interventions are perceived as having caused the change?
II	Type of review question	Mixed methods
III	Objective of the review	The Department of Health and Social Care's tobacco control plan notes the influence of adult role models, and hence the importance of supporting adults who smoke habitually to quit in order to prevent uptake of smoking. Increasing cessation could create an environment where smoking cigarettes is not seen as normal or acceptable, through 'denormalisation'. It is important to ascertain whether smoking cessation mass media campaigns and mobile phone applications ('apps') for adults contribute to denormalising smoking and therefore potentially prevent the uptake of smoking in children, young people and young adults.
IV	Eligibility criteria – population/disease/condition/issue/domain	**Included**:

[8] Throughout, smoking refers to the use of all smoked tobacco products. 'Smoking' or 'smoking habitually' refers, unless specifically stated otherwise, to people who smoke weekly or more often. Smoking experimentally is defined as smoking less than weekly.

		Children, young people and young adults[9] who do not smoke and have never smoked habitually. **Excluded**: People aged 25 and over. Children, young people and young adults who smoke or have ever smoked habitually. **Setting:** • Online settings and digital channels, including social media.
V	Eligibility criteria – intervention(s)/exposure(s)/prognostic factor(s)	**Included**: Campaigns delivered through mass media or mobile apps which have a stated and measured aim of increasing smoking cessation in adults aged 18 and over. Mass media interventions have been defined as programmes or campaigns aimed at reaching large numbers of people via television, internet, radio, print media and digital media. Mass media interventions do not necessarily involve person to person contact but are often population level or population group level. Delivery of campaigns may be via: • Digital media, for example social media, content sharing sites, interactive channels and digital communication channels (see protocol for RQ1.1)

[9] For the purposes of this guidance, children are aged 5-11, young people are 12-17 and young adults are 18-24 inclusive.

		• Text messaging • Television and radio • Newspapers • Posters, leaflets or booklets • Community interventions where the major component is mass media. Apps accessed on mobile phones or tablets which are wholly or partly purpose built for smoking cessation will also be included. Campaigns may be of any duration and frequency. Studies where the only difference between intervention and control is a mass media or app component will also be included. **Excluded**: Interventions in which mass media is not a core component or for which results for mass media elements alone are not presented. Individual-level technology such as wearable devices. Interventions delivered through mass media which are not campaigns, for example online counselling. Interventions aimed at children and young people, including interventions to encourage or support children and young people to quit smoking.

		Interventions to prevent the uptake of tobacco.
VI	Eligibility criteria – comparator(s)/control or reference (gold) standard	**Included**: • No intervention. • Another mass media intervention. • Interventions with no mass media component.
VII	Outcomes and prioritisation	**Quantitative outcomes (1.2a)** Smoking status is the key outcome for this review. <u>Critical outcome</u> • Smoking status of children and young people at longest available follow-up. Measured as: – Relative risk of smoking habitually – Relative risk of smoking experimentally (less often than habitually) Where biochemically validated measures are available, these will be preferred to self-reported measures. Trials where interventions are allocated by cluster and analysis is at the individual level are vulnerable to unit of analysis error. To mitigate for this, studies should correct for clustering. If no adjustment has been carried out, the review team will adjust the effect estimates by inflating standard errors, as described in the Cochrane manual.

		<u>Important outcomes</u>
		
		Children and young people's:
		
		• Knowledge of smoking harms (only extracted if another outcome reported, as a potential mediator of the effect)
		• Attitudes towards smoking (including intention to smoke)
		• Health-related quality of life (using validated patient-report measures, for example EQ-5D).
		• Adverse or unintended (positive or negative) effects. For example:
		  – incorrect health perceptions or health anxiety
		  – experimentation or intention to experiment with smoking
		
		Qualitative outcomes (1.2b)
		
		For mass media or app-based cessation interventions aimed at adults, views of children, young people and young adults will be examined on perceptions of social acceptability of smoking, any impact of the intervention on these perceptions, and information on what aspects of the intervention caused the response (content, mode etc.).
		
		Barriers and facilitators to uptake of the intervention will not be investigated for this review question as mass media generally do not require active uptake and are instead part of an individual's environment.
		
		Cost/resource use associated with the intervention

		The following outcomes will be extracted in reviews of the health economic evidence, where available: • cost per quality-adjusted life year • cost per unit of effect • net benefit • net present value • cost/resource impact or use associated with the intervention or its components **Excluded**: Any study which does not include a primary outcome.
VIII	Eligibility criteria – study design	**Included study designs**: • Systematic reviews of included study designs • RCTs (including cluster RCTs) • Non-randomised controlled trials • Controlled before and after studies • Interrupted time series

		Qualitative studies: • Focus groups, interview-based studies or surveys with open-ended responses. Must be related to an eligible intervention. Economic studies: • Cost-utility (cost per QALY) • Cost benefit (i.e. net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimization • Cost-consequence **Excluded study designs**: • Longitudinal cohort and uncontrolled ‘before-and-after’ intervention studies • Cross-sectional surveys • Correlation studies • Case control studies
IX	Other inclusion exclusion criteria	**Studies**

		This is a new review question for this update. **Exclusion criteria (1.2a)** • Studies with less than 1 year between baseline measurement and follow-up measurement. • Mixed populations (for example, study samples that do not match the required age ranges or also include people who smoke habitually, with insufficient disaggregation to enable data relevant to this review to be extracted). Only papers published in the English language will be included. Only studies carried out in OECD countries will be included (for effectiveness data) and in the UK (for qualitative data). Only studies published in 1998 onwards will be included. Only full published studies (not protocols or summaries even where they include some data) will be included. **Systematic reviews** Relevant systematic reviews (SRs) identified from database searches will be citation searched. Highly relevant systematic reviews may be included as a primary source of data. These SRs will be assessed against the inclusion criteria for this protocol, and their quality will be assessed using the ROBIS tool. Where the SR is highly relevant and of high quality, details or data from the systematic review may be used.

		In addition to any SRs meeting the above criteria, other primary studies will be included if they were published after the publication date of the SR and meet the protocol inclusion criteria. Full economic analyses and costing studies identified from searches will be included. Costing data will not be used for the purpose of the effectiveness review. Health economics reviews and modelling will be conducted by the York Health Economics Consortium (YHEC).

X	Proposed sensitivity/sub-group analysis, or meta-regression	The following factors will be of interest in any meta-regression or subgroup analyses:
		
		• Mode of delivery
		  ○ digital media compared with other 'traditional' media like radio, television, pamphlets
		  ○ single mode vs multi-mode
		• Message framing
		  ○ emphasis on harms of smoking vs benefits of being smoke-free
		• Age of target population
		  ○ children and young people 17 years old and under compared with young adults 18-24 years old
		• Campaign organisers
		  ○ Tobacco organisation-funded interventions vs others
		
		Components of apps which are of interest may include:
		
		• Target audience
		• Intervention intensity
		
		App design (e.g. user-friendliness)

XI	Selection process – duplicate screening/selection/analysis	The review will use the priority screening function within the EPPI-reviewer systematic reviewing software. Double screening will be carried out for 10% of titles and abstracts by a second reviewer. Disagreements will be resolved by discussion. Inter-rater reliability will be assessed and reported. If below 90%, a second round of 10% double screening will be considered. The study inclusion and exclusion lists will be checked with members of the PHAC to ensure no studies are excluded inappropriately.
XII	Data management (software)	EPPI Reviewer will be used: • to store lists of citations • to sift studies based on title and abstract • to record decisions about full text papers • to order freely available papers via retrieval function • to request papers via NICE guideline Information Services • to store extracted data Cochrane Review Manager 5 will be used to perform meta-analyses. Any meta-regression analyses will be undertaken using the R software package. Qualitative data will be summarised using secondary thematic analysis. A matrix approach will be used to compare findings with quantitative evidence.
XIII	Information sources – databases and dates	The purpose of the search is to identify the best available evidence to address the questions without producing an unmanageable volume of results. The same search will be used to identify evidence for both RQ1.1 and RQ1.2.

		The following methods will be used to identify the evidence: • the databases listed below will be searched with an appropriate strategy. • the websites listed below will be searched or browsed with an appropriate strategy. • studies included in the evidence reviews for PH14 which support the recommendations that are being updated and potentially meet the criteria for the current review will be added to the search results. • studies included in the surveillance reviews for PH14 will be added to the search results. • selected studies that are potentially relevant to the current review will be identified from the bibliography of any systematic reviews identified during the search process that are not being included in their own right. • forward citation searching will be done using selected studies prioritised from the surveillance reviews, the studies included in PH14, scoping searches or any relevant systematic reviews identified in the search process. **Database strategies** The database strategy will be adapted as appropriate from the one used in PH14 in 2007, taking into account the resources available to this review, the subscriptions that NICE has, changes in indexing policies and the final scope for the current evidence reviews. The principal search strategy is listed in Appendix A. The search strategy will take this broad approach: (smoking OR tobacco OR cigarettes or shisha or) AND (mass media or digital media) AND (children OR young people OR young adults) AND 1998-Current AND Limits

		Feedback on the principal database strategy will be sought from PHAC members. The principal search strategy will be developed in MEDLINE (Ovid interface) and then adapted, as appropriate, for use in the other sources listed, taking into account their size, search functionality and subject coverage. The databases will be: • Applied Social Science Index and Abstracts (ASSIA) via ProQuest • Cochrane Central Register of Controlled Trials (CENTRAL) via Wiley • Cochrane Database of Systematic Reviews (CDSR) via Wiley • Embase via Ovid • Health Management Information Consortium (HMIC) via Ovid • MEDLINE via Ovid • MEDLINE-in-Process (including Epub Ahead-of-Print) via Ovid • PsycINFO via Ovid • Social Policy and Practice (SPP) via Ovid **Database search limits** Database functionality will be used, where available, to exclude: • non-English language papers • animal studies • editorials, letters and commentaries • conference abstracts and posters • registry entries for ongoing or unpublished clinical trials • duplicates. Sources will be searched from 1998 to current. The database search strategies will not use any search filters for specific study types.

		Cost effectiveness evidence A separate search will be done for cost effectiveness evidence. The following databases will be searched again with agreed study-type search filters applied to a strategy based on the one in Appendix A: • Embase via Ovid • MEDLINE via Ovid • MEDLINE-in-Process (including Epub Ahead-of-Print) via Ovid In addition, the following sources will be searched without study-type filters: • Campbell Collaboration via https://campbellcollaboration.org/library.html • EconLit via Ovid • HTA database via CRD https://www.crd.york.ac.uk/CRDWeb/ • NHS EED via CRD https://www.crd.york.ac.uk/CRDWeb The main website results will be rescanned to check if there are any results potentially relevant to cost effectiveness. **Citation searching** Forward citation searching will be conducted using Web of Science (WOS) Core Collection. Only those references which NICE can access through its WOS subscription will be added to the search results. Only papers published in 1998-Current and in the English language will be included in the search results. Duplicates will be removed in WOS before downloading. **Websites** The following websites will be searched with an appropriate strategy:

		• Health Services/Technology Assessment Texts (HSTAT) https://www.ncbi.nlm.nih.gov/books/NBK16710 • NICE Evidence Search https://www.evidence.nhs.uk • Tobacco Control Database for the WHO European Region http://data.euro.who.int/tobacco The websites of relevant organisations, including the ones below, will be browsed: • Action on Smoking and Health (ASH) http://ash.org.uk/home • Center for Disease Control and Prevention (CDC) Media Campaign Resource Center (MCRC) https://www.cdc.gov/tobacco/multimedia/media-campaigns/index.htm • Fresh http://freshne.com/what-we-do/our-campaigns • Local Government Association https://www.local.gov.uk • National Centre for Smoking Cessation and Training http://www.ncsct.co.uk • Northern Ireland Assembly http://www.niassembly.gov.uk/ • Public Health England https://www.gov.uk/government/organisations/public-health-england • Royal College of Physicians https://www.rcplondon.ac.uk • Royal College of Paediatrics and Child Health https://www.rcpch.ac.uk/ • Scottish Government https://www.gov.scot • Smokefree NHS https://www.nhs.uk/smokefree • Smoking Toolkit Study http://www.smokinginengland.info • Treat Tobacco http://www.treatobacco.net/en/index.php • UK Centre for Tobacco and Alcohol Studies http://ukctas.net/index.html

		• University of Bath Tobacco Control Research Group https://researchportal.bath.ac.uk/en/organisations/uk-centre-for-tobacco-control-studies • University of Stirling Centre for Tobacco Control Research https://www.stir.ac.uk/about/faculties-and-services/health-sciences-sport/research/research-groups/centre-for-tobacco-control-research/publications • Welsh Government https://gov.wales/?lang=en The website results will be reviewed on screen and documents in English and published from 2007-Current that are potentially relevant to review question 1.1 or 1.2 will be listed with their title and abstract (if available) in a Word document. The initial screening decision will be made using this Word file. Any items selected for review at full text will be added to EPPI-Reviewer. **Quality assurance** The guidance Information Services team at NICE will quality assure the principal search strategy and peer review the strategies for the other databases. Any revisions or additional steps will be agreed by the review team before being implemented. Any deviations and a rationale for them will be recorded alongside the search strategies. **Search results** The database search results will be downloaded to EndNote before duplicates are removed using automated and manual processes. The de-duplicated file will be exported in RIS format for loading into EPPI-Reviewer for data screening.

XIV	Identify if an update	This question is a new question to add to the evidence that was included in PH14 [published July 2008].
XV	Author contacts	Please see the guideline development page.
XVI	Highlight if amendment to previous protocol	For details please see section 4.5 of Developing NICE guidelines: the manual
XVII	Search strategy – for one database	For details please see Appendix B
XVIII	Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as Appendix D (effectiveness evidence tables) or H (economic evidence tables).
XIX	Data items – define all variables to be collected	For details please see evidence tables in Appendix D (effectiveness evidence tables) or H (economic evidence tables).
XX	Methods for assessing bias at outcome/study level	Standard study checklists will be used to critically appraise individual studies. For details please see Appendix H of Developing NICE guidelines: the manual The risk of bias across all available evidence will be evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ GRADE will be used to assess confidence in the findings from quantitative evidence synthesis. GRADE-CERQual will be used to assess confidence in the findings from qualitative evidence syntheses.

XXI	Criteria for quantitative synthesis (where suitable)	For details please see section 6.4 of Developing NICE guidelines: the manual Non-randomised studies are at risk of confounding. These studies should adjust for confounders which are decided by the committee to have important potential to affect the result, or the allocation into intervention or control groups. These factors are: - Peer or family smoking - Baseline smoking status (where sample includes people who smoke) - Socioeconomic status Where adjusted results are provided, these will be used in analysis. Where no adjustment has taken place, this will be considered when assessing risk of bias.
XXII	Methods for analysis – combining studies and exploring (in)consistency	**Heterogeneity** Data from different studies will be pooled in a meta-analysis where they are investigating the same outcome and where the resulting meta-analysis may be useful for decision-making. Cluster and individual randomised controlled trials will be pooled. Randomised and non-randomised controlled studies investigating the same outcomes will be pooled. Results will be stratified by design (cluster, individual, randomised and non-randomised for a maximum of four groups stratified) and the P value of the interaction between study design and effect evaluated. A P value of <0.2 will be considered significant. If interaction is significant, results will be presented separately for each group, but if not, will be presented with one averaged effect estimate. It is anticipated that studies included in the review will be heterogeneous with respect to participants, interventions, comparators, setting and study design. Where significant between study heterogeneity in methodology, population, intervention or comparator is

		identified by the reviewer in advance of data analysis, random effects models will be used. If methodological heterogeneity is not identified in advance but the I2 value is ≥50%, random effects models will also be used. If the I^2 value is above 50%, heterogeneity will be judged to be serious and so will be downgraded by one level in GRADE. If the I^2 value is above 75%, heterogeneity will be judged to be very serious and will be downgraded by two levels in GRADE. If the studies are found to be too heterogeneous to be pooled statistically, a narrative synthesis will be conducted. **Imprecision** No minimally important difference (MID) thresholds relevant to this guideline were identified from the COMET database or other published source. MIDs were agreed by committee. Uncertainty is introduced where confidence intervals cross the MID threshold. If the confidence interval crosses one lower MID threshold, this indicates 'serious' risk of imprecision. Crossing both MID thresholds indicates 'very serious' risk of imprecision in the effect estimate. Where the MID is 'any significant change' there is effectively only one threshold (the line of no effect), and so only one opportunity for downgrading. In this instance, outcomes will be downgraded again if they are based on small samples (<300 people). MIDs for outcomes will be included in the methods section of the individual reviews.
XXIII	Meta-bias assessment – publication bias, selective reporting bias	For details please see Appendix H of Developing NICE guidelines: the manual.

XXIV	Assessment of confidence in cumulative evidence	For details please see sections 6.4 and 9.1 of Developing NICE guidelines: the manual.
XXV	Rationale/context – Current management	For details please see the introduction to the evidence review.
XXVI	Describe contributions of authors and guarantor	A multidisciplinary committee will develop the guideline. The committee will be convened by Public Health Internal Guidelines Development (PH-IGD) team and chaired by Sharon Hopkins in line with section 3 of Developing NICE guidelines: the manual. Staff from Public Health Internal Guidelines Development team will undertake systematic literature searches, appraise the evidence, conduct meta-analysis where appropriate and draft the guideline in collaboration with the committee. Cost-effectiveness analysis will be conducted by YHEC where appropriate. For details please see Developing NICE guidelines: the manual.
XXVII	Sources of funding/support	PH-IGD is funded and hosted by NICE
XXVIII	Name of sponsor	PH-IGD is funded and hosted by NICE
XXIX	Roles of sponsor	NICE funds PH-IGD to develop guidelines for those working in the NHS, public health and social care in England.
XXX	PROSPERO registration number	Not applicable

1

Appendix B – Literature search strategies

Search approach

A joint search was done for RQA and RQB because there was overlap in the search terms required to describe the populations and interventions adequately. The overlap and use of a single search meant that the search went back to 1998 for both reviews, when RQA would have been limited to 2007-2018 if it were done in isolation.

Two searches were done to cover RQA and RQB.

- The main search was done on 21 September 2018
- A top-up search for children aged 5-11 was done on 12 December 2018.

The MEDLINE searches below were run after QA, peer review and consultation with the committee. The strategies were adapted as appropriate to the other databases listed in the protocol (see the sources tables below).

Additional search results were obtained from the surveillance review for PH14, the scoping searches for this topic and from forwards citation searching using Web of Science.

Further searches were undertaken for grey literature using the websites listed in the protocol. These results were screened separately in Word.

Full details of all the search strategies are available in a separate document from the NICE guidance Information Services team.

Main search

Sources searched to identify the evidence

Database name	Date searched	Database Platform	Database segment or version	No. of records
Applied Social Science Index and Abstracts (ASSIA)	21/09/2018	ProQuest	(1987 - current)	996
Cochrane Central Register of Controlled Trials (CENTRAL)	21/09/2018	Wiley	Cochrane Central Register of Controlled Trials Issue 8 of 12, August 2018	894
Cochrane Database of Systematic Reviews (CDSR)	21/09/2018	Wiley	Cochrane Database of Systematic Reviews Issue 9 of 12, September 2018	54
Embase	21/09/2018	Ovid	Embase 1974 to 2018 September 20	4464
Health Management Information Consortium (HMIC)	21/09/2018	Ovid	HMIC Health Management Information Consortium 1979 to July 2018	354
MEDLINE	21/09/2018	Ovid	Ovid MEDLINE(R) 1946 to September 20, 2018	6147
MEDLINE-in-Process (including	21/09/2018	Ovid	Ovid MEDLINE(R) Epub Ahead of Print September 20, 2018, Ovid	891

Epub Ahead-of-Print)			MEDLINE(R) In-Process & Other Non-Indexed Citations September 20, 2018	
PsycINFO	21/09/2018	Ovid	PsycINFO 1806 to September Week 3 2018	3163
Social Policy and Practice (SPP)	21/09/2018	Ovid	Social Policy and Practice 201807	111
Surveillance reviews for PH14	21/09/2018	-	Web of Science Core Collection (1990-present)	7
Scoping searches	21/09/2018	-		4
Forwards citation searching	21/09/2018	-		237

Database strategy – main search as run in MEDLINE and adapted for other sources

Database(s): **Ovid MEDLINE(R)** 1946 to September 20, 2018

#	Searches	Results
1	exp "tobacco use"/	1842
2	tobacco/	28763
3	"tobacco use disorder"/	10397
4	"tobacco use cessation"/	1029
5	"tobacco use cessation products"/	1491
6	smoking/	133449
7	exp Pipe smoking/	58
8	smoking reduction/	14
9	"smoking cessation"/	25932
10	vaping/	182
11	nicotine/	24133
12	Smokers/	426
13	exp Smoking Devices/	7693
14	smoking prevention/	17381
15	Varenicline/	1122
16	Bupropion/	2852
17	(smoking* or smoker* or antismok* or anti smok* or anti-smok*).ti,ab.	201673
18	(tobacco* or nicotin* or cigar* or cigs).ti,ab.	178654
19	(ecig* or e-cig* or e-voke* or vape* or vaping).ti,ab.	1853
20	(bidi or bidis or beedi or beedis or kretek* or hand roll* or handroll* or rollies).ti,ab.	473
21	(bupropion* or zyban* or varenicline* or champix* or nicorette* or niquitin* or nicotinell* or nicassist*).ti,ab.	4520
22	(waterpipe* or water pipe* or dokha or dokhas or hookah or hookahs or hooka or hookas or shisha or shishas or sheesha or sheeshas).ti,ab.	1396
23	or/1-22	352825
24	Multimedia/	1789
25	exp tape recording/	15221
26	Computers, Handheld/	3250
27	Internet/	65890
28	Blogging/	883

29	Social Networking/	2171
30	Social Media/	4987
31	Electronic Mail/	2452
32	Cell Phone/	7451
33	Text Messaging/	2014
34	Smartphone/	2213
35	video games/	4352
36	mobile applications/	3357
37	((digital* or digitis* or digitiz* or electronic* or wireless or online) adj3 (intervention* or communicat* or technol* or media* or market* or campaign* or advert* or ad or ads or commercial* or device* or platform* or forum* or community* or communities* or discussion*)).ti,ab.	19718
38	(ehealth* or e-health* or mhealth* or m-health* or mobile health*).ti,ab.	4746
39	((laptop or palm or handheld or tablet or pda or pc) adj3 comput*).ti,ab.	2541
40	((mobile* or cell* or tablet*) adj (phone* or telephone* or handset* or hand-set*)).ti,ab.	7227
41	(smartphone* or smart-phone* or smart telephone* or iphone* or i-phone* or ipad* or i-pad* or blackberry* or smartwatch* or smart-watch* or android or device-based or mobile-based or podcast*).ti,ab.	8857
42	((mobile or electronic* or digital*) adj3 (device* or tablet* or application*)).ti,ab.	11040
43	(app or apps or online* or on-line* or internet* or www or web or website* or webpage* or webcast* or portal or search engine*).ti,ab.	267371
44	(social media* or social network* or blog* or vlog* or video-blog*).ti,ab.	15642
45	(Bebo* or Facebook* or YouTube* or Twitter* or LinkedIn* or Pinterest* or Google* or Tumblr* or Instagram* or WhatsApp* or Reddit* or Flickr* or SnapChat* or Yahoo* or Bing* or MSN* or Wikipedia* or Myspace*).ti,ab.	29464
46	(e-mail* or email* or electronic mail* or mailing list*).ti,ab.	11581
47	(text messag* or texting or texter* or texted or SMS or short messag* or multimedia messag* or multi-media messag* or mms or instant messag*).ti,ab.	10029
48	(advergame or advergames or advergaming).ti,ab.	19
49	Telephone/	11001
50	exp mass media/	43648
51	information dissemination/	14613
52	persuasive communication/	3454
53	nonverbal communication/	3904
54	exp serial publications/	49285
55	pamphlets/	3684
56	telecommunications/	4690
57	exp marketing/	33420
58	communications media/	1414
59	Government Publications as Topic/	694
60	Audiovisual Aids/	6733
61	(marketing or advertis* or publicis* or publiciz* or publicity or mass media or media campaign* or communication* media*).ti,ab.	40659

62	((tv or television* or televize* or televise* or cable or satellite or cinema* or movie* or media or newspaper* or journal* or magazine* or interactive* or dvd or dvds or video* or tape or tapes or cassette* or motion picture* or film or films or broadcast* or radio* or audio* or telecommunicat*) adj3 (market* or campaign* or advert* or ad or ads or commercial* or program* or intervention* or information*)).ti,ab.	29415
63	((pamphlet* or handout* or hand out* or booklet* or leaflet* or literature or poster or posters or publication* or viral* or buzz*) adj3 (market* or campaign* or advert* or commercial* or program* or intervention* or information*)).ti,ab.	9884
64	((outreach* or written* or printed* or oral* or campaign* or resource* or disseminat*) adj1 information).ti,ab.	6556
65	((nationwide* or statewide* or countrywide* or citywide* or national* or nation wide* or state wide* or country wide* or city wide* or government*) adj3 (market* or campaign* or advert* or commercial* or program* or intervention* or information)).ti,ab.	32970
66	or/24-65	606896
67	23 and 66	16439
68	minors/	2466
69	Adolescent Behavior/ or Adolescent/ or Adolescent Health/ or Adolescent Development/	1885101
70	Child Behavior/ or Child/ or Child Development/	1600512
71	young adult/	687201
72	students/	50230
73	(young* adj2 (adult* or person* or people* or men or man or women or woman or male* or female*)).ti,ab.	182877
74	(child* or adolescen* or kid or kids or youth* or youngster* or minor or minors or underage* or under-age* or "under age*" or teen or teens or teenager* or juvenile* or boy or boys or boyhood or girl or girls or girlhood or schoolchild* or "school age*" or schoolage* or pupil or pupils or student*).ti,ab.	1772138
75	("under 18" or "under eighteen*" or "under 25" or "under twenty five*").ti,ab.	3061
76	(("twelve" or "thirteen" or "fourteen" or "fifteen" or "sixteen" or "seventeen" or "eighteen" or "nineteen" or "twenty" or "twenty one" or "twenty two" or "twenty three" or "twenty four") adj2 (year or years or age or ages or aged)).ti,ab.	36970
77	(("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") adj2 (year or years or age or ages or aged)).ti,ab.	731508
78	or/68-77	4026228
79	67 and 78	7707
80	Animals/ not (Animals/ and Humans/)	4463817
81	79 not 80	7689
82	limit 81 to (letter or historical article or comment or editorial or news or case reports)	397
83	81 not 82	7292
84	limit 83 to english language	6887
85	limit 84 to yr="1998 -Current"	6147

Key to search operators

/	Medical Subject Heading (MeSH) term
.ti	Searches the title field
.ab	Searches the abstract field
*	Truncation symbol (searches all word endings after the stem)

adj*n*	Adjacency operator to retrieve records containing the terms within a specified number (*n*) of words of each other

Age 5-11 years top up
Sources searched to identify the evidence

Database name	Date searched	Database Platform	Database segment or version	No. of records
Cochrane Central Register of Controlled Trials (CENTRAL)	12/12/18	Wiley	Cochrane Central Register of Controlled Trials Issue 8 of 12, August 2018	267
Cochrane Database of Systematic Reviews (CDSR)	12/12/18	Wiley	Cochrane Database of Systematic Reviews Issue 9 of 12, September 2018	23
Embase	12/12/18	Ovid	Embase 1974 to 2018 September 20	912
Health Management Information Consortium (HMIC)	12/12/18	Ovid	HMIC Health Management Information Consortium 1979 to July 2018	69
MEDLINE	12/12/18	Ovid	Ovid MEDLINE(R) 1946 to September 20, 2018	897
MEDLINE-in-Process (including Epub Ahead-of-Print)	12/12/18	Ovid	Ovid MEDLINE(R) Epub Ahead of Print September 20, 2018, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations September 20, 2018	156
PsycINFO	12/12/18	Ovid	PsycINFO 1806 to September Week 3 2018	341
Social Policy and Practice (SPP)	12/12/18	Ovid	Social Policy and Practice 201807	19

Database strategy – age top up as run in MEDLINE and adapted for other sources

Database(s): Ovid MEDLINE(R) 1946 to December 06, 2018

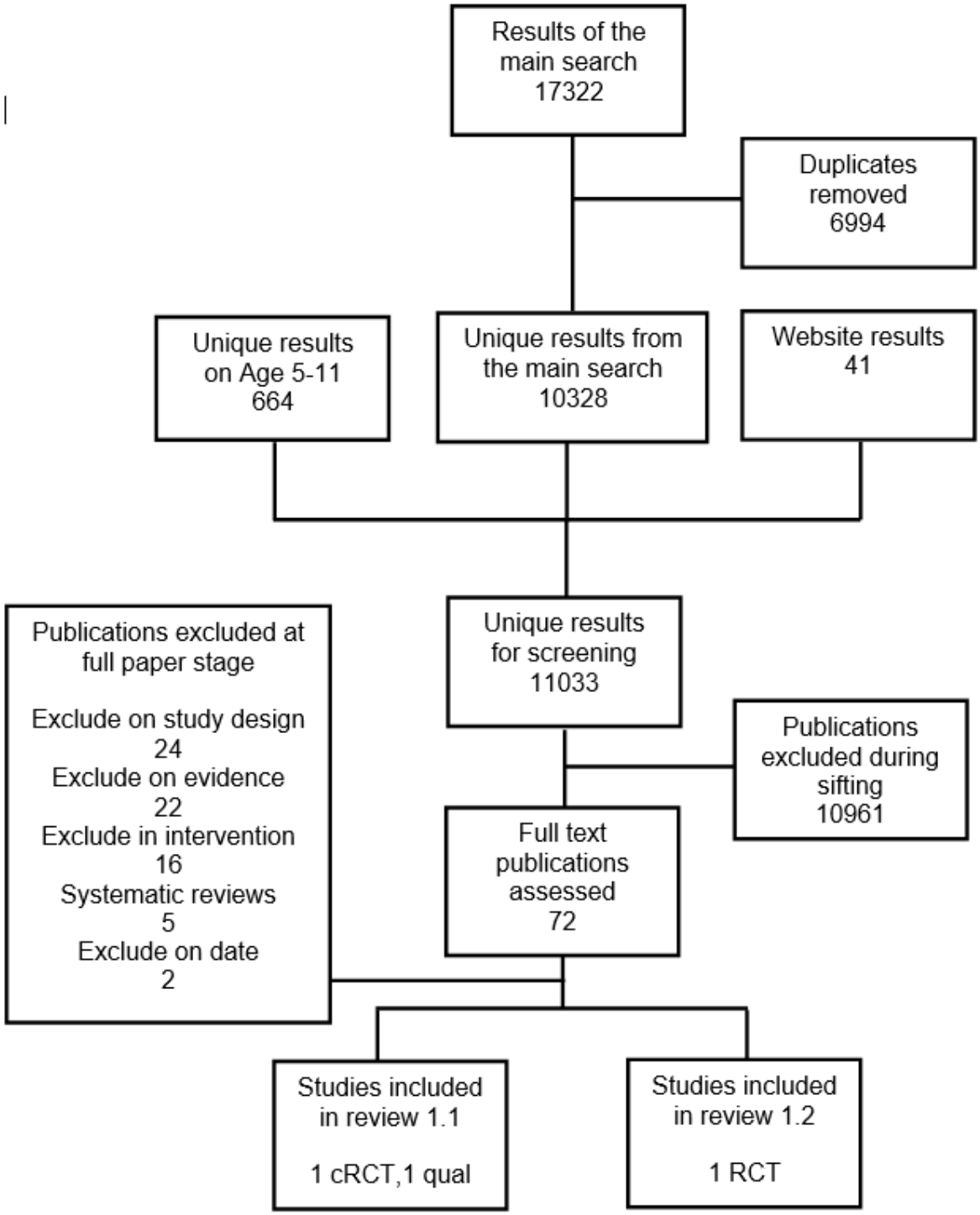
#	Searches	Results
1	exp "tobacco use"/	2008
2	tobacco/	28976
3	"tobacco use disorder"/	10469
4	"tobacco use cessation"/	1037
5	"tobacco use cessation products"/	1512
6	smoking/	134065
7	exp Pipe smoking/	64
8	smoking reduction/	14
9	"smoking cessation"/	26127
10	vaping/	209
11	nicotine/	24254

12	Smokers/	510
13	exp Smoking Devices/	7913
14	smoking prevention/	17444
15	Varenicline/	1134
16	Bupropion/	2867
17	(smoking* or smoker* or antismok* or anti smok* or anti-smok*).ti,ab.	203332
18	(tobacco* or nicotin* or cigar* or cigs).ti,ab.	179945
19	(ecig* or e-cig* or e-voke* or vape* or vaping).ti,ab.	1943
20	(bidi or bidis or beedi or beedis or kretek* or hand roll* or handroll* or rollies).ti,ab.	476
21	(bupropion* or zyban* or varenicline* or champix* or nicorette* or niquitin* or nicotinell* or nicassist*).ti,ab.	4572
22	(waterpipe* or water pipe* or dokha or dokhas or hookah or hookahs or hooka or hookas or shisha or shishas or sheesha or sheeshas).ti,ab.	1418
23	or/1-22	355508
24	Multimedia/	1802
25	exp tape recording/	15265
26	Computers, Handheld/	3284
27	Internet/	66447
28	Blogging/	894
29	Social Networking/	2233
30	Social Media/	5217
31	Electronic Mail/	2469
32	Cell Phone/	7543
33	Text Messaging/	2066
34	Smartphone/	2384
35	video games/	4468
36	mobile applications/	3570
37	((digital* or digitis* or digitiz* or electronic* or wireless or online) adj3 (intervention* or communicat* or technol* or media* or market* or campaign* or advert* or ad or ads or commercial* or device* or platform* or forum* or community* or communities* or discussion*)).ti,ab.	20125
38	(ehealth* or e-health* or mhealth* or m-health* or mobile health*).ti,ab.	4877
39	((laptop or palm or handheld or tablet or pda or pc) adj3 comput*).ti,ab.	2571
40	((mobile* or cell* or tablet*) adj (phone* or telephone* or handset* or hand-set*)).ti,ab.	7330
41	(smartphone* or smart-phone* or smart telephone* or iphone* or i-phone* or ipad* or i-pad* or blackberry* or smartwatch* or smart-watch* or android or device-based or mobile-based or podcast*).ti,ab.	9173
42	((mobile or electronic* or digital*) adj3 (device* or tablet* or application*)).ti,ab.	11297
43	(app or apps or online* or on-line* or internet* or www or web or website* or webpage* or webcast* or portal or search engine*).ti,ab.	271776
44	(social media* or social network* or blog* or vlog* or video-blog*).ti,ab.	16030
45	(Bebo* or Facebook* or YouTube* or Twitter* or LinkedIn* or Pinterest* or Google* or Tumblr* or Instagram* or WhatsApp* or Reddit* or Flickr* or SnapChat* or Yahoo* or Bing* or MSN* or Wikipedia* or Myspace*).ti,ab.	30312

46	(e-mail* or email* or electronic mail* or mailing list*).ti,ab.	11757
47	(text messag* or texting or texter* or texted or SMS or short messag* or multimedia messag* or multi-media messag* or mms or instant messag*).ti,ab.	10171
48	(advergame or advergames or advergaming).ti,ab.	19
49	Telephone/	11058
50	exp mass media/	43838
51	information dissemination/	14784
52	persuasive communication/	3475
53	nonverbal communication/	3914
54	exp serial publications/	49795
55	pamphlets/	3704
56	telecommunications/	4697
57	exp marketing/	33557
58	communications media/	1426
59	Government Publications as Topic/	695
60	Audiovisual Aids/	6753
61	(marketing or advertis* or publicis* or publiciz* or publicity or mass media or media campaign* or communication* media*).ti,ab.	41024
62	((tv or television* or televize* or televise* or cable or satellite or cinema* or movie* or media or newspaper* or journal* or magazine* or interactive* or dvd or dvds or video* or tape or tapes or cassette* or motion picture* or film or films or broadcast* or radio* or audio* or telecommunicat*) adj3 (market* or campaign* or advert* or ad or ads or commercial* or program* or intervention* or information*)).ti,ab.	29793
63	((pamphlet* or handout* or hand out* or booklet* or leaflet* or literature or poster or posters or publication* or viral* or buzz*) adj3 (market* or campaign* or advert* or commercial* or program* or intervention* or information*)).ti,ab.	9998
64	((outreach* or written* or printed* or oral* or campaign* or resource* or disseminat*) adj1 information).ti,ab.	6615
65	((nationwide* or statewide* or countrywide* or citywide* or national* or nation wide* or state wide* or country wide* or city wide* or government*) adj3 (market* or campaign* or advert* or commercial* or program* or intervention* or information)).ti,ab.	33345
66	or/24-65	614971
67	23 and 66	16614
68	(("five" or "six" or "seven" or "eight" or "nine" or "ten" or "eleven") adj2 (year or years or age or ages or aged)).ti,ab.	174632
69	(("5" or "6" or "7" or "8" or "9" or "10" or "11") adj2 (year or years or age or ages or aged)).ti,ab.	658296
70	or/68-69	794947
71	67 and 70	1126
72	Animals/ not (Animals/ and Humans/)	4487157
73	71 not 72	1124
74	limit 73 to (letter or historical article or comment or editorial or news or case reports)	18
75	73 not 74	1106
76	limit 75 to english language	1020
77	limit 76 to yr="1998 -Current"	897

Appendix C – Public health evidence study selection

For RQ A and B combined



Appendix D – Public health evidence tables

Review A

Cremers 2015

<table>
<tr><th>Bibliographic reference/s</th><td>Cremers H. P., Mercken L., Candel M. et al. 2015. A web-based, computer-tailored smoking prevention program to prevent children from starting to smoke after transferring to secondary school: randomised controlled trial. Journal of Medical Internet Research, 17(3): e59.</td></tr>
<tr><td>Study name</td><td>Fun without Smokes</td></tr>
<tr><td>Registration</td><td>Netherlands Trial Register NTR3116</td></tr>
<tr><td>Study type</td><td>Cluster RCT</td></tr>
<tr><td>Study dates</td><td>2011-2013</td></tr>
<tr><td>Objective</td><td>To evaluate whether computer-tailored feedback messages (with and without prompts) are effective in decreasing intention to smoke and smoking behaviour in children aged 11-13.</td></tr>
<tr><td>Country/ Setting</td><td>Netherlands. Primary schools.</td></tr>
<tr><td>Number of participants / clusters</td><td>175 schools (clusters) randomised to three conditions (13 dropped out after randomisation before baseline measurement – their condition not reported.)
Baseline:
Intervention plus prompt: 59 schools, 1207 children
Intervention only: 51 schools, 1003 children
Control: 52 schools, 1003 children.

Power: 81 schools and 3240 children required at baseline to detect predicted change in smoking given assumption of 60% attrition at final follow-up. Baseline numbers of schools achieved but children not.</td></tr>
<tr><td>Attrition</td><td>
<table>
<tr><th></th><th>Intervention plus prompt</th><th>Intervention only</th><th>Control</th></tr>
<tr><td>T1 (12 months)
Drop out n (% of baseline)</td><td>462 (38.3)</td><td>340 (33.9)</td><td>265 (26.4)</td></tr>
<tr><td>T2 (25 months)
Drop out n (% of baseline)</td><td>234 (19.4)</td><td>187 (18.6)</td><td>242 (24.1)</td></tr>
<tr><td>Baseline sample completing T2 n (% of baseline)</td><td>511 (42.3)</td><td>476 (47.5)</td><td>496 (49.5)</td></tr>
</table>

Authors report that older children more likely to drop out at T1.
Males, older children, non-Western ethnic background, intervention plus prompt conditions and those with more smokers in their environment were more likely to drop out at T2.</td></tr>
<tr><td>Participant /community characteristics.</td><td>Authors report not representative of population because only 162 schools chose to participate out of 3500 approached.</td></tr>
</table>

Bibliographic reference/s	**Cremers H. P., Mercken L., Candel M. *et al.* 2015. A web-based, computer-tailored smoking prevention program to prevent children from starting to smoke after transferring to secondary school: randomised controlled trial. *Journal of Medical Internet Research,* 17(3): e59.**				
		Intervention plus prompt	Intervention	Control	Significant difference
	Mean age years (SD)	10.36	10.35	10.38	No
	Female (%)*	51.2	49.4	51.1	No
	SES (high) n (%)	440 (36.45)	431 (42.97)	483 (48.16)	<0.001*
	Ethnicity Western n (%)	1072 (88.82)	875 (87.23)	889 (88.63)	No
	Intention to smoke at baseline n (%)	35 (2.90)	37 (3.69)	37 (3.69)	No
	Smoking at baseline n (%)	16 (1.33)	10 (1.00)	11 (1.10)	No
	Parents/immediate family smoking	Not reported			
	*higher SES in control group				
Method of allocation	Primary schools (clusters) randomised to one of three study arms in computer-determined sequence using clustered randomisation scheme. Randomisation appears successful apart from socio-economic status.				
Inclusion criteria	Not reported. Appears to be schools agreeing to take part.				
Exclusion criteria	Children whose parents refused to be involved (1.7% of all participants).				
Intervention	TIDieR Checklist criteria	Details			
	Brief Name	Fun without smokes			
	Rationale/theory/Goal	To repeatedly expose children to non-smoking information and tailored feedback about non-smoking.			
	Materials used	Online website requiring personalised log-in code. Post-questionnaire, three tailored emails on consecutive days received (content was attitudes towards smoking; perceived social influence; self-efficacy explanations). Emails sent as PDF and available on the website. Children's names and questionnaire results used to tailor messages. Website included animated videos with non-smoking content, games about non-smoking, and tailored messages. Content of website changed regularly to include new information and interactive elements. Prompt group also received six prompt messages via email and SMS to remind them to use the website.			

<table>
<tr><th>Bibliographic reference/s</th><th colspan="2">Cremers H. P., Mercken L., Candel M. et al. 2015. A web-based, computer-tailored smoking prevention program to prevent children from starting to smoke after transferring to secondary school: randomised controlled trial. Journal of Medical Internet Research, 17(3): e59.</th></tr>
<tr><td rowspan="8"></td><td>Procedures used</td><td>NA</td></tr>
<tr><td>Provider</td><td>Fun without Smokes website</td></tr>
<tr><td>Method of delivery</td><td>Online (no classroom time for intervention mentioned, except time to complete T0 and T1 questionnaires. T2 questionnaires were completed in children’s own time, as they had left primary and started secondary school).</td></tr>
<tr><td>Location</td><td>Online.</td></tr>
<tr><td>Duration</td><td>2 years</td></tr>
<tr><td>Intensity</td><td>Self-moderated. Intervention group with prompt could be viewed as more intense.</td></tr>
<tr><td>Tailoring/adaptation</td><td>NA</td></tr>
<tr><td>Other details</td><td>NA</td></tr>
<tr><td rowspan="4">Comparison</td><td>TIDieR Checklist criteria</td><td>Details</td></tr>
<tr><td>Brief Name</td><td>Control group</td></tr>
<tr><td>Rationale/theory/Goal</td><td>NA</td></tr>
<tr><td>Materials used</td><td>Website used only to complete questionnaires at baseline and two follow-up points. No other intervention described.</td></tr>
<tr><td>Follow up</td><td colspan="2">Overall study length 25 months.
T0 to T1: 12 months
T0 to T2: 25 months</td></tr>
<tr><td>Data collection</td><td colspan="2">Data was collected by survey completed at the Fun without Smokes website.
T0 and T1 questionnaires completed in school time by all groups, with teachers’ supervision. T2 questionnaire completed after children transition to secondary school and in their own time: incentives for this questionnaire were available and included film vouchers, gift cards etc. A reminder was also sent for final questionnaires via SMS or email.
Survey not specifically validated. Outcome measures based on self-reports used in other studies but validation not mentioned.
Outcome assessor blinding not mentioned.
Children’s awareness of trial / study not reported.</td></tr>
<tr><td>Critical outcomes measures and effect size. (time points)</td><td colspan="2">Smoking among those who did not smoke at baseline
Intervention plus prompt (IP) vs control, 25 month follow-up
<table>
<tr><th></th><th>IP n= 504</th><th>C n= 488</th><th>aOR* (95% CI)</th><th>aRR** calculated by analyst</th></tr>
<tr><td>Number of children who smoke n (%)</td><td>3 (0.59)</td><td>5 (1.02)</td><td>0.53 (0.12, 2.47)</td><td>0.53 (0.12, 2.43)</td></tr>
</table>
*Adjusted for age, gender, ethnicity, SES, advantageous and disadvantageous attitude, social norms and self-efficacy.
**The control group prevalence used to calculate the aRR was 1.02%.</td></tr>
</table>

Bibliographic reference/s	**Cremers H. P., Mercken L., Candel M. *et al.* 2015. A web-based, computer-tailored smoking prevention program to prevent children from starting to smoke after transferring to secondary school: randomised controlled trial. *Journal of Medical Internet Research,* 17(3): e59.**

Intervention (I) vs control, 25 month follow-up

	I n= 470	C n= 488	aOR* (95% C.I)	aRR** calculated by analyst
Number of children who smoke n (%)	5 (1.06)	5 (1.02)	1.01 (0.24, 4.21)	1.01 (0.24. 4.04)

*Adjusted for age, gender, ethnicity, SES, advantageous and disadvantageous attitude, social norms and self-efficacy.

**The control group prevalence used to calculate the aRR was 1.29%.

Results were also reported for T1: no results were significant (IP vs C aOR 1.13 [0.13, 9.98] and I vs C aOR 0.50 [0.04, 5.59]).

Important outcomes measures and effect size. (time points)

Intention to smoke among those who did not intend to smoke at baseline

Intervention plus prompt (IP) vs control, 25 month follow-up

	IP n= 491	C n= 465	aOR* (95% C.I)	aRR** calculated by analyst
Number of children with positive smoking intention n (%)	7 (1.43)	6 (1.29)	0.78 (0.26, 2.32)	0.78 (0.26, 2.28)

*Adjusted for age, gender, ethnicity, SES, advantageous and disadvantageous attitude, social norms and self-efficacy.

**The control group prevalence used to calculate the aRR was 1.29%.

Intervention (I) vs control, 25 month follow-up

	I n= 446	C n= 465	aOR* (95% C.I)	aRR** calculated by analyst
Number of children with positive smoking intention n (%)	10 (2.24)	6 (1.29)	1.31 (0.45, 3.82)	1.30 (0.45, 3.69)

*Adjusted for age, gender, ethnicity, SES, advantageous and disadvantageous attitude, social norms and self-efficacy.

**The control group prevalence used to calculate the aRR was 1.29%.

Results were also reported for T1: no results were significant (IP vs C aOR 0.67 [0.30, 1.50] and I vs C aOR 0.76 [0.34, 1.67]).

Study also reported effectiveness by SES interaction. SEs was shown not to moderate the association between intention to start smoking behaviour or the

Bibliographic reference/s	**Cremers H. P., Mercken L., Candel M. *et al.* 2015. A web-based, computer-tailored smoking prevention program to prevent children from starting to smoke after transferring to secondary school: randomised controlled trial. *Journal of Medical Internet Research,* 17(3): e59.**		
	type of intervention at either time point (P values reported to be >0.1) and no further detail reported.		
Statistical Analysis	In analysis authors adjust for age, gender, ethnicity, SES, advantageous and disadvantageous attitude (having a positive or negative attitude towards smoking judged with questionnaire answers Cronbach alpha >0.80 so acceptable internal consistency), social norms (judged with questionnaire answers about smoking status and behaviour of family and friends Cronbach alpha 0.70 so acceptable internal consistency) and self-efficacy. Children were nested in schools and therefore authors carried out multilevel analysis to adjust for clustering. Multilevel logistic regression analyses carried out to assess intervention effect. Children who smoked at T0 were excluded from analyses. Due to high dropout, multiple imputation of missing variables applied. Program effects analysed by averaging results from all datasets.		
Risk of bias (ROB) Overall ROB	Outcome name: Smoking behaviour		
	Outcome	Judgement	Comments
	Random sequence generation	Some concerns	Allocation sequence was random. Unlikely that subversion took place. Most baseline characteristics equal (except SES).
	Timing of identification and recruitment of participants in relation to timing of randomisation	Low risk	All participants in a cluster (school class) were included in the intervention so had essentially been recruited by the school. Unlikely that selection affected by knowledge of intervention.
	Deviation from intended intervention	Some concerns	No information on whether participants knew they were in a trial, or knew their own status in relation to others. Unlikely to be deviations from intended interventions as this would require change in school. No clusters analysed in wrong group.

Bibliographic reference/s	**Cremers H. P., Mercken L., Candel M. *et al.* 2015. A web-based, computer-tailored smoking prevention program to prevent children from starting to smoke after transferring to secondary school: randomised controlled trial. *Journal of Medical Internet Research,* 17(3): e59.**		
	Missing outcome data	High risk	Data about clusters not available after baseline – only individual data reported. Significant attrition (>50%) in all groups. More dropout in intervention plus prompt group.
	Measurement of the outcome	Some concerns	Unclear whether children (outcome assessors) were aware a trial was taking place. Unclear whether they were aware of intervention status. Outcome assessment may be affected by knowledge of intervention received – need to report better outcomes / social desirability bias.
	Selection of the reported result	Low risk	Data does not appear to be reported based on results.
	Overall Risk of Bias	High risk of bias	
	Other outcome details: same assessment for intention to smoke		
Source of funding	ZonMw (Netherlands organisation for Health Research and Development).		
Comments	Higher socio-economic status of the control group (although controlled for) may have influenced results. Controlling for SES was done by postcode which authors recognise is not sensitive. Authors report that very low population levels of smoking in children age 11-13 might be a reason for the lack of effect seen – previous versions of similar (non-web based) interventions in the past have had higher background levels of smoking. Authors mention that interventions at a later age when smoking initiation may begin might be more effective. No information from children about their experiences of the intervention.		
Additional references	None		

Struik 2012

Bibliographic reference	Struik, L. L., Bottorff L. J., Jung M., Budgen C., 2012. Reaching adolescent girls through social networking: A new avenue for smoking prevention messages. Canadian Journal of Nursing Research 44 (3): 84-103.	
Trial registration	None reported.	
Study type	Qualitative	
Study dates	Not reported	
Aim	To explore perspectives of adolescent girls on use of social networking sites to deliver tobacco control messages which are tailored for young women.	
Country/geographical location	Canada, British Columbia	
Setting/School type	Community: participants recruited via community and educational settings in the geographical area.	
Inclusion criteria	Female, between 15 and 18 years of age, previous or current use of Facebook or MySpace, ability to converse in English.	
Exclusion criteria	None reported.	
Intervention	TIDieR Checklist criteria	Details
	Brief Name	A selection of existing tobacco control messages specifically aimed at young women, selected from various websites of health organisations and agencies. Message names and descriptions: The Truth / remove one: a poster from The Truth Campaign displaying a teenage girl holding a cigarette. Her throat and the cigarette are circled and the message reads “remove one” (expressing health effects) Poster child: A young girl holding a cigarette. Areas of her body are highlighting visuals of tobacco-related damage with descriptions (expressing health effects) America’s Next Top Model: A model with long hair holding a cigarette looks into a mirror. The reflection is a woman who is bald due to chemotherapy, and the woman looks sad (expressing health effects) Chic? / no, throat cancer: A ‘beautiful’ young woman with a tracheotomy is depicted (expressing health effects) Above the influence / I do me: A teenage girl is depicted, and text expresses her decision not to be drawn into drugs or alcohol (expressing resistance of peer pressure) Cigarettes smoke people: in a bistro / restaurant, two female arms are burning down like cigarettes to demonstrate that addiction controls its hosts/ Live to see it: Barbies (unclothed and blurred) pictured walking down a street lined by cactuses: “In 2042, the temperature in big cities will increase by 8 degrees on average. Live to see it, Quit smoking now.”

Bibliographic reference	**Struik, L. L., Bottorff L. J., Jung M., Budgen C., 2012. Reaching adolescent girls through social networking: A new avenue for smoking prevention messages. Canadian Journal of Nursing Research 44 (3): 84-103.**	
	Rationale/theory/Goal	Rationales of the ads are varied and are explored. 1-4 and 6: education / awareness. 5: empowerment. 7: provocation. Tones are also varied: 1 and 3: negative. 2. 4. 6 shocking. 5 and 7: positive.
	Materials used	All ads are seen online, on websites of health bodies, ad companies and other sites.
	Procedures used	Not reported
	Provider	1: Truth (American Legacy Foundation national campaign) 2: The British Columbia Ministry of Health and NOW Communications of Vancouver 3: Believed to be America's Next Top Model 4: WHO for 2010 World No Tobacco Day 5: Produced for Above the Influence (Partnership for Drug Free America) 6: The Cancer Patients Aid Association 7: ADESF (Ads of the world)
	Method of delivery / Location	Online (but viewed in a focus group setting for the purpose of the study
	Duration	Focus groups lasted approximately 2 hours, intervention messages viewed during the focus group.
	Other details	To note that this is not the usual setting that the intervention would be experienced in.
Comparison	TIDieR Checklist criteria	Details
	Brief Name	No comparison group used in this study
Follow up	Not applicable	
Qualitative methods	Research question(s)	What are adolescent girls' perspectives on the use of social networking sites to deliver tobacco control (TC) messages targeting young women?
	Theoretical approach	Interpretive descriptive methodology to identify patterns and themes relating to phenomenon of interest to elicit new understandings from particular individuals.
	Data collection	Three focus groups of around 2 hours. A topic guide was used and the TC messages were viewed to stimulate discussion. Messages were displayed as posters, with questions: (1) What do you like about this message and why? (2) What do you not like about this message and why? (3) What would you change about this message and why? Participants were also given thumbs up / thumbs down stickers and asked to indicate two favourite and two least favourite messages (aligning with social media type responses).
	Method and process of analysis	Transcripts analysed through constant comparison, an iterative process. Data coded (incl. field notes). Broad

Bibliographic reference	Struik, L. L., Bottorff L. J., Jung M., Budgen C., 2012. Reaching adolescent girls through social networking: A new avenue for smoking prevention messages. Canadian Journal of Nursing Research 44 (3): 84-103.	
		categories developed and critically analysed. Quotes were selected to represent key themes and subthemes.
	Population and sample collection	17 young women in total, aged 16-19 across 3 focus groups (n = 5, n = 8, n = 4). Most Caucasian (n = 15), one identified as Filipino, one Korean. 11 non-smokers and 6 smokers (although only 4 reported being addicted or having smoked in past month). 4 were high school students, 12 university students, and 1 member of workforce.
Results (Population for all themes was all, unless indicated otherwise)	Key themes	Supporting material
	Outcome: Perceptions of specific messages	
	Clarity of messaging	Messages often either “overwhelming to the viewer” or lacked clarity and so was seen as confusing in the message it was trying to portray.
	Identification with characters portrayed / genuineness	People in adverts (usually young women) were seen as passive, or could not be identified with: “Put her in situations that we’d be in, as opposed to just standing there” [about a poster with a faceless woman pictured] “I wish her whole face was shown to be able to see what her emotions are.” “I think it’s important to bring that out and let smokers know that you are killing your friend, your family member, just people around you, so it’s not just about you.”
	Fear-factor in messaging	Participants who smoked more often thought scary messages were effective compared with non-smokers: “I think that the scarier images are the more effective ones because they are, ultimately, more truthful. It’s not sugar-coated, it’s just, like, this is what’s going to happen. So having the truthful images like the poster [Poster Child] over there [is] more effective because it [shows] what’s actually going to happen.” Those who didn’t smoke thought fear-appeal messages were not effective because they made people feel negative: they didn’t want to me “scared” or “grossed-out”.
	Portrayal of women	A strong theme throughout. Participants did not like messaging which used female nudity / sexuality in their messaging. Authors say the participants were frustrated / offended: “It’s just like every TV commercial, or something that has to do about women. It usually involves sex or looks, and that shouldn’t matter at all. Like, we women should just be loved for who we are. It doesn’t matter if they are fat, skinny, muscular. [It] doesn’t matter — they are just

Bibliographic reference	Struik, L. L., Bottorff L. J., Jung M., Budgen C., 2012. Reaching adolescent girls through social networking: A new avenue for smoking prevention messages. Canadian Journal of Nursing Research 44 (3): 84-103.	
		the same. I don't know. I just I hate it when they make women look like sluts." All participants agreed that portraying girls as "sex objects" did not "appeal" to them and detracted from a message's effectiveness. Participants felt these ads would be "clicked on mostly by guys." Participants felt that there was too much emphasis on physical attractiveness and not enough on health and well-being: "Make it more about your life, not just vanity." Participants were more positive towards portrayals of women who had attributes that were important to them: "I would look at this message, because, besides the cigarette, this girl is sophisticated and I would possibly strive to be more like her."
	Outcome: Perceptions of social media in general for prevention	
	Instant impact	Social media facilitates instant impact Messages should be put together so that they deliver instant impact: "When you're on Facebook, everything's really quick [and] gets at you right away. You want to get to that information as quick as possible, because you're not going to put a lot of time into looking at these." "I think including animation would make it stand out, because a lot of the side ads are still images and we ignore it — like, no one actually looks and reads it, but if the smoking ad is flashing or moving in some way, then people would be like, "Oh, what's that?"
	Engaging / novel / intriguing	The cigarettes smoke people message was seen as novel: "Since you don't know what it is . . . or . . . see stuff like that . . . you click on it."
	Trust in legitimacy of adverts	Where an ad appears will impact perceptions of legitimacy: "I just don't know where [messages in the sidebar are] taking me, so I don't go there, but if it was actually part of Facebook somehow, or just posted somewhere and a bunch of people were Liking it [and] it was being passed through the Walls, then I'd be more interested in it."
	Positive message framing	Positive messaging was preferred by participants in the setting of social media (see above for 'fear-factor in messaging' for contrast to this): "Push that you can get a fresh start." Some of the non-smokers also said they would be inclined to click on TC messages that demonstrate the positives of not smoking: "I think it would be a really effective way to advertise if the focus is [to show] that you can really have fun, have

Bibliographic reference	**Struik, L. L., Bottorff L. J., Jung M., Budgen C., 2012. Reaching adolescent girls through social networking: A new avenue for smoking prevention messages. Canadian Journal of Nursing Research 44 (3): 84-103.**		
		an active social life, and connect with your peers over things that are not smoking."	
	Interactivity	Participants were used to being able to interact with information so would be receptive to this: "play" with information "draw with their mouse" Ideas like information expanding as they were "scrolling the mouse along the body [of the character in the advert]". "Maybe something to grab your interest and then have a whole host of pages where you have information [and] you have some kind of interaction where you could post things or ask questions or something like that. Because if you just have one thing, then it doesn't give you anything so that you can do something with the information that you gather. And if you try to cram too much onto one picture, you kind of draw away from it."	
Risk of bias	Item	Yes/No/Can't tell	Comments
	1. Was there a clear statement of the aim of the research?	Yes	Goal very clear and consistently referenced throughout paper
	2. Is a qualitative methodology appropriate?	Yes	Question requires subjective experiences to answer
	3. Was the research design appropriate to address the aims of the research?	Yes	Interpretive descriptive methodology used and explained. Focus group design appropriate and is discussed and justified.
	4. Was the recruitment strategy appropriate to the aims of the research?	Yes	Recruitment at community areas and through Facebook – appropriate to use online settings. Restricted to people who use online settings also appropriate (although participants who don't use social media may have had a different view).
	5. Was the data collected in a way that addressed the research issue?	Yes	Setting described but not justified. Data audio-recorded. Field notes and transcriptions. Sessions described. Saturation not described.
	6. Has the relationship between researcher and participants been adequately considered?	Can't tell	Female moderator used to be gender-sensitive but no further information.

Bibliographic reference	Struik, L. L., Bottorff L. J., Jung M., Budgen C., 2012. Reaching adolescent girls through social networking: A new avenue for smoking prevention messages. Canadian Journal of Nursing Research 44 (3): 84-103.		
	7. Have ethical issues been taken into consideration?	Yes	Signed consent, ethical approval
	8. Was the data analysis sufficiently rigorous?	Can't tell	Description of analysis process and how themes were derived. Quotes selected to be representative. Data present and sufficient but not very rich. No analysis of researcher's own role.
	9. Is there a clear statement of findings?	Yes	Findings clearly presented. Some discussion for-and-against and depending on smoking status. Only one analyst. Regularly relates back to research question.
	10. Is the research valuable?	Yes	Discusses relevance of these findings.
Overall risk of bias	Low risk of bias		
Source of funding	Psychosocial oncology research training (PORT) programme of the Canadian Institutes of health Research.		
Comments	No conflicts of interest statement		

Review B

Schuck 2015

Bibliographic reference/s	Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. *Addictive behaviours* 40: 66-72.
Study name	None
Registration	The protocol is registered in the Netherlands Trial Register (NTR2707).
Study type	RCT
Study dates	2011-2014 (identified by checking protocol)
Objective	To identify whether telephone counselling for parents and subsequent parental smoking cessation affect smoking-related cognitions and smoking initiation among children of smoking parents. To note: the intervention group in the study is the control group for the purposes of our review. The control group in the study is our intervention group. Reported as per our requirements rather than as per the paper throughout this data extraction.
Country/ Setting	Netherlands (countrywide). Recruited through primary schools.

<table>
<tr><td>Bibliographic reference/s</td><td>Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. Addictive behaviours 40: 66-72.</td></tr>
<tr><td>Study name</td><td>None</td></tr>
<tr><td>Number of participants / clusters</td><td>Intervention at baseline:
256 parent-child pairs

Control at baseline:
256 parent-child pairs

Power calculation not mentioned but authors conclude that a fully powered trial is needed in future – unlikely that this trial is powered.</td></tr>
<tr><td>Attrition</td><td>
<table>
<tr><th></th><th>Intervention</th><th>Control</th></tr>
<tr><td>T1 (12 months)
Drop out n (% of baseline)</td><td>Adults: 21 (8.2)
Children: 24 (9.4)</td><td>Adults: 37 (14.5)
Children: 44 (17.2)</td></tr>
<tr><td>T2 (30 months)
Drop out n (% of baseline)
Data collected for children only</td><td>45 (17.6)</td><td>68 (26.6)</td></tr>
<tr><td>Baseline sample completing T2 n (% of baseline)
Children only</td><td>211 (82.4)</td><td>188 (73.4)</td></tr>
</table>
</td></tr>
<tr><td>Participant /community characteristics.</td><td>Baseline characteristics of children
<table>
<tr><th></th><th>Intervention</th><th>Control</th><th>Significant difference</th></tr>
<tr><td>Mean age (SD)</td><td>10.5 (1.0)</td><td>10.5 (1.0)</td><td>No</td></tr>
<tr><td>Female (%)</td><td>48</td><td>52.7</td><td>No</td></tr>
<tr><td>Has never smoked (%)</td><td>91.7</td><td>93.3</td><td>No</td></tr>
<tr><td>Parent is of Dutch ethnicity (%)</td><td>98</td><td>97.7</td><td>No</td></tr>
<tr><td>Parents/immediate family smoking</td><td colspan="2">All have at least one smoking parent (parent involved in cessation intervention)</td><td>NA</td></tr>
</table>
Baseline characteristics of parents
<table>
<tr><th></th><th>Intervention</th><th>Control</th><th>Significant difference</th></tr>
<tr><td>Mean age (SD)</td><td>42 (5.1)</td><td>42.3 (5.6)</td><td>No</td></tr>
<tr><td>Female (%)</td><td>53.9</td><td>51.2</td><td>No</td></tr>
<tr><td>Low education standard (%)</td><td>14.1</td><td>16.4</td><td>No</td></tr>
<tr><td>Unemployed (%)</td><td>17.2</td><td>14.5</td><td>No</td></tr>
<tr><td>Mean cigarettes per day (SD)</td><td>16.8 (7.7)</td><td>15.7 (8.0)</td><td>No</td></tr>
</table>
</td></tr>
</table>

Bibliographic reference/s	**Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. *Addictive behaviours* 40: 66-72.**			
Study name	None			
	Mean years of smoking (SD)	24.6 (8.0)	25.1 (7.4)	No
	Mean FTND* score (SD)	4.0 (2.4)	4.0 (2.4)	No
	*FTND: Fagerström Test for Nicotine Dependence. Score 0-10, higher score indicates more intense addiction. Representativeness not discussed. 438 schools distributed study invitation letters to all children ages 9-12. Final numbers suggest a small proportion took up the invite (potentially explained by low proportions of smokers).			
Method of allocation	After registration, parents were randomly assigned to either the intervention or the control using a random allocation schedule. No further information on the randomisation process given. Baseline characteristics between groups do not indicate that the randomisation process failed.			
Inclusion criteria	Parents: 1) daily or weekly smoking, 2) having a child between 9 and 12 years, 3) considering stopping smoking (currently or in the future) 4) providing informed consent for participation for themselves and their child.			
Exclusion criteria	None reported			
Intervention	**TIDieR Checklist criteria**	**Details**		
	Brief Name	Standard self-help brochure		
	Rationale/theory/Goal	Reported in the study as the control group but is the intervention of interest for this review. Information based on empirically supported practices for advice on smoking cessation. Rationale is that the control condition (telephone counselling) and cessation regardless of reason will produce attitudes less favourable towards smoking and decrease risk of smoking initiation.		
	Materials used	40-page colour-printed self-help brochure including didactic information on: • Nicotine dependence • Health benefits associated with quitting smoking • Tips and advice on how to initiate and maintain abstinence • Instruction in use of cognitive and behavioural skills to avoid triggers to smoke and cope with urges to smoke • Strategies for managing a lapse or relapse to smoking		

Bibliographic reference/s	**Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. *Addictive behaviours* 40: 66-72.**	
Study name	None	
		• Information on use of NRT / pharmacological treatment, including for people who smoke more than 10 cigarettes per day.
	Procedures used	Not reported.
	Provider	Not reported
	Method of delivery	No blinding needed if remote delivery (i.e. post)
	Location	Not reported
	Duration	NA
	Intensity	NA
	Tailoring/adaptation	NA
	Planned treatment fidelity	NA
	Actual treatment fidelity	NA
	Other details	None.
Comparison	**TIDieR Checklist criteria**	**Details**
	Brief Name	Telephone counselling in combination with three supplementary brochures tailored to smoking parents.
	Rationale/theory/Goal	Rationale is that the control condition (telephone counselling) and cessation regardless of reason will produce attitudes less favourable towards smoking and decrease risk of smoking initiation in children.
	Materials used	Seven counsellor-initiated phone calls based on cognitive-behaviour therapy (CBT) and motivational interviewing (MI). Emphasis on: • Providing information on nicotine dependence • Exploring ambivalence regarding smoking and quitting • Enhancing intrinsic motivation for behavioural change • Providing behavioural support (anticipation of difficult situations and coping strategies) • Relapse prevention • NRT / pharmacological treatment recommended if participants smoked 10+ cigarettes / day. Three accompanying booklets titled *Smoke-free parents* designed for the study. Booklets contained didactic information,

Bibliographic reference/s	**Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. *Addictive behaviours* 40: 66-72.**	
Study name	None	
		tips and advice, motivational messages and 'parent-relevant information' (e.g. effects of second-hand smoke on children).
	Procedures used	Not reported
	Provider	Telephone counselling provided by counsellors of Dutch national quitline. Booklets designed for the study (who designed them not reported)
	Method of delivery	Telephone: blinding information not reported, and not sure whether counsellors knew they were taking part in a trial.
	Location	Not reported.
	Duration	Calls took place over a period of three months
	Other details	None.
Follow up	Follow up was conducted at 3-months, 12-months and 30-months (the last follow-up was reportedly added to the study after the previous follow-ups were complete). 3-month follow-up not extracted as it does not meet the inclusion criteria for the review. 30-month follow-up is main outcome but will be compared to 12-month follow up and any outcomes of note reported.	
Data collection	Informed consent forms and baseline questionnaires sent to parents after registration. Authors report that most participants completed survey online. Those without internet access or with technical problems received a hard copy. Questionnaires also sent at all follow-up points. Measures: • Parental smoking cessation: 6-month prolonged abstinence self-reported by parent (reporting both abstinence for at least 6 months and abstinence for the last 7 days, even a puff). • Knowledge: Children's perceived safety of casual smoking: children were asked to indicate the degree to which they agree with three statements on a scale ranging from 1 (totally disagree) to 4 (totally agree): "There is no harm in smoking a cigarette once in a while", "It is safe to smoke for only one or two years", and "If you only smoke once in a while you won't become addicted". Higher scores indicate a higher perceived safety of casual smoking. Internal consistency was acceptable at baseline, 12-month follow-up, and 30-month follow-up (Cronbach's alpha=.66, .80, and .79, respectively). • Self-efficacy to refrain from smoking: To assess refusal self-efficacy, children were asked to indicate the perceived difficulty not to smoke in six smoking-specific situations. Response options ranged from 1 (very difficult) to 6 (very easy). Example items are: "To refuse a cigarette when offered one, I find …" and "Explaining to other people why I do not want to smoke, I find …". Higher scores indicate higher self-efficacy to refrain from smoking. Internal consistency was good at baseline, 12-month follow-up, and 30-month follow-up (Cronbach's alpha = .87, .90, and .91, respectively).	

<table>
<tr><td>Bibliographic reference/s</td><td>Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. Addictive behaviours 40: 66-72.</td></tr>
<tr><td>Study name</td><td>None</td></tr>
<tr><td></td><td>

<u>Intention to smoke: susceptibility to smoking:</u> To assess susceptibility to smoking, children were asked to indicate the degree to which they agree with three statements. Response options ranged from 1 (definitely not) to 4 (definitely yes). Example items are: “Do you think you will try a cigarette soon” and “If one of your best friends were to offer you a cigarette, would you smoke it?” Higher scores indicate a higher susceptibility to smoking. Internal consistency was good at baseline, 12-month follow-up, and 30-month follow-up (Cronbach's alpha = .70, .84, and .90, respectively).
<u>Smoking status: smoking initiation among children:</u> Smoking initiation among children. To assess onset of smoking, children were asked: “Have you ever smoked, even if only a single puff?” Children reporting that they had never smoked, not even a single puff, were considered never-smokers. Children reporting that they had smoked were considered initiators.

Blinding of outcome assessors not reported.
</td></tr>
<tr><td>Critical outcomes measures and effect size. (time points)</td><td>
Children’s smoking initiation at 30-month follow up by intervention
Among baseline non-smokers only
<table>
<tr><td></td><td>Intervention group n= 256</td><td>Control group n= 256</td><td>RR (95% C.I)*</td></tr>
<tr><td>Number taking up smoking (%)</td><td>34 (14.7)</td><td>47 (20.1)</td><td>0.72 (0.48, 1.09)</td></tr>
</table>
*Relative risk calculated from raw data presented in paper. No adjustments for confounders.
Risk at 12-month follow-up did not show a different direction of effect (RR 0.93, 95%CI 0.45, 1.94).

Children’s smoking initiation at 30-month follow up by parental cessation
Among baseline non-smokers only
<table>
<tr><td></td><td>Parental cessation n= 84</td><td>No parental cessation n= 428</td><td>RR (95% C.I)*</td></tr>
<tr><td>Number taking up smoking (%)</td><td>9 (11.8)</td><td>72 (18.5)</td><td>0.64 (0.33, 1.22)</td></tr>
</table>
*Relative risk calculated from raw data presented in paper. No adjustments for confounders.
Risk at 12-month follow-up did not show a different direction of effect (RR 0.64, 95%CI 0.20, 2.07).
Authors report that controlling for socio-demographic characteristics of children (i.e. age and gender) and potential confounders of smoking cessation among parents (i.e. age, gender, educational level, smoking status of partner) did not change the results.

Effectiveness of the interventions for parental cessation is not reported in this study (reported elsewhere) and is not the focus of this review.
</td></tr>
</table>

<table>
<tr><td>Bibliographic reference/s</td><td>Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. Addictive behaviours 40: 66-72.</td></tr>
<tr><td>Study name</td><td>None</td></tr>
<tr><td>Important outcomes measures and effect size. (time points)</td><td>
Children’s perceived safety of smoking at 30-month follow up by intervention*
<table>
<tr><td></td><td>Intervention group n= 256</td><td>Control group n= 256</td><td>MD (95% C.I)</td></tr>
<tr><td>Mean difference in perceived safety score at follow-up (SD)</td><td>1.7 (0.8)</td><td>1.8 (0.8)</td><td>-0.10 (-0.25, 0.05)</td></tr>
</table>
* range: 1 = totally unsafe to 4 = totally safe
Mean difference at 12-month follow-up had a different direction of effect, but CIs overlap with the CIs for 30-month follow-up and both include the line of no effect (0) (MD 0.10, 95%CI -0.06, 0.26).

Children’s self-efficacy at 30-month follow up by intervention*
<table>
<tr><td></td><td>Intervention group n= 256</td><td>Control group n= 256</td><td>MD (95% C.I)</td></tr>
<tr><td>Mean difference in efficacy score at follow-up (SD)</td><td>5.2 (0.8)</td><td>5.1 (0.8)</td><td>0.10 (-0.04, 0.24)</td></tr>
</table>
* range: 1 = very difficult to refrain to 6 = very easy to refrain
Mean difference at 12-month follow-up did not show a different direction of effect (MD 0.10, 95%CI -0.06, 0.26).

Children’s susceptibility to smoking at 30-month follow up by intervention*
<table>
<tr><td></td><td>Intervention group n= 256</td><td>Control group n= 256</td><td>MD (95% C.I)</td></tr>
<tr><td>Mean difference in susceptibility score at follow-up (SD)</td><td>1.5 (0.6)</td><td>1.6 (0.5)</td><td>-1.0 (-0.20, 0.00)</td></tr>
</table>
* range: 1 = not susceptible to 4 = susceptible
Mean difference at 12-month follow-up did not show a different direction of effect (MD 0.00, 95%CI -0.08, 0.08).
</td></tr>
<tr><td>Statistical Analysis</td><td>Multiple imputation to handle missing data on outcomes in children. Amount of missing data reported as ranging from 8.8% to 22.3%.
Continuous outcomes (perceived safety of smoking, self-efficacy, susceptibility to smoking) a 2 (group) x 4 (time) repeated measures MANOVA was conducted, controlling for correlations between smoking-related cognitions.
Smoking initiation: logistic regression analysis to predict smoking initiation at follow-up, including only baseline never-smokers.</td></tr>
<tr><td>Risk of bias (ROB)
Overall ROB</td><td>Children’s smoking initiation
<table>
<tr><th>Outcome</th><th>Judgement (Low / High / some concerns)</th><th>Comments</th></tr>
</table>
</td></tr>
</table>

Bibliographic reference/s	**Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. *Addictive behaviours* 40: 66-72.**		
Study name	None		
	Risk of bias arising from the randomisation process	Low risk of bias	Random allocation schedule used. No significant baseline differences between groups.
	Risk of bias due to deviations from intended interventions (assignment)	Some concerns	Participants presumed to be aware of their intervention. No deviations from intervention identified. ITT analysis used for smoking initiation, unclear what assumptions made about drop outs.
	Missing outcome data	Some concerns	Multiple imputation used to handle missing data on outcome variables among children. Attrition not large, but outcome is rare so potential bias. Attrition not dissimilar between groups.
	Risk of bias in measurement of the outcome	Some concerns	Method of measuring outcome was self-reported, so could be subject to bias. Both intervention and control were active interventions so bias may not be dissimilar between groups.
	Risk of bias in selection of the reported result	Low risk of bias	Result not likely to have been selected on basis of multiple outcome measurements / analysis Was the trial analysed
	Other sources of bias	Low risk of bias	None identified.
	Overall Risk of Bias	Some concerns	
	Other outcome details All some concerns		
Source of funding	ZonMW (Netherlands Organisation for Health Care Research and Development).		

Bibliographic reference/s	**Schuck K., Roy O., Marlo K. et al., 2015. Promoting smoking cessation among parents: Effects on smoking-related cognitions and smoking initiation in children. *Addictive behaviours* 40: 66-72.**
Study name	None

Comments	• Each child-parent couple received 100 euros for participating in data collection. At 30-month follow-up children received 10 euros additionally.
	• The study was originally conducted to find the effectiveness of the interventions for cessation, and this publication extends this to look at preventing uptake in children.
	• The study found evidence that the intervention for parents does not affect uptake of smoking or smoking-related cognitions in children. It also found that parental cessation does not affect uptake of smoking in children. The authors discuss that:
	  ○ Parental cessation may need to be maintained for longer before effects on child cognition can be observed
	  ○ The outcomes and measures selected may not capture changes
	  ○ The sample size in the current study was small (and presumably underpowered)
	  ○ Effects on outcomes may become apparent later on in child development.

Additional references	None.

Appendix E - Forest plots

Review A

No meta-analysis could be conducted for this review.

Review B

No meta-analysis could be conducted for this review

Appendix F – GRADE tables

Review A

Profile 1: Smoking among those who did not smoke at baseline (Critical)

Quality assessment							No of patients		Effect		Confidence
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Fun without smokes	Control	Relative (95% CI)	Absolute	
Intervention plus prompt vs control (follow-up mean 25 months; assessed with: self-report questionnaire)											
1 Cremers 2015	cRCT	serious[1]	NA	no serious indirectness	serious[2]	none	3/504 (0.6%)	5/488 (1%)	RR 0.53 (0.12 to 2.43)	5 fewer per 1000 (from 9 fewer to 15 more)	⊕⊕OO LOW
Intervention vs control (follow-up mean 25 months; assessed with: self-report questionnaire)											
1 Cremers 2015	cRCT	serious[3]	NA	no serious indirectness	serious[2]	none	5/470 (1.1%)	5/488 (1%)	RR 1.01 (0.24 to 4.21)	0 more per 1000 (from 10 fewer to 41 more)	⊕⊕OO LOW

[1] Significant attrition (>50%) in all groups. Attrition higher in intervention group. Self-reported outcome measure could be subject to bias.
[2] Confidence Interval (CI) overlaps the MID. Result is consistent with increased or decreased risk of smoking compared with the control group.
[3] Significant attrition (>50%) in all groups. Self-reported outcome measure could be subject to bias.

Profile 2: Intention to smoke among those who did not intend to smoke at baseline (Important)

Quality assessment							No of patients		Effect		Confidence
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Fun without smokes	Control	Relative (95% CI)	Absolute	
Intervention plus prompt vs control (follow-up mean 25 months; assessed with: self-report questionnaire)											
1 Cremers 2015	cRCT	serious[1]	NA	no serious indirectness	serious[2]	none	7/491 (1.4%)	6/465 (1.3%)	RR 0.78 (0.26 to 2.28)	3 fewer per 1000 (from 10 fewer to 17 more)	⊕⊕OO LOW
Intervention vs control (follow-up mean 25 months; assessed with: self-report questionnaire)											

1 Cremers 2015	cRCT	serious[3]	NA	no serious indirectness	serious[2]	none	10/446 (2.2%)	6/465 (1.3%)	RR 1.30 (0.45 to 3.69)	4 more per 1000 (from 7 fewer to 35 more)	⊕⊕OO LOW

[1] Significant attrition (>50%) in all groups. Attrition higher in intervention group. Self-reported outcome measure could be subject to bias.
[2] Confidence Interval (CI) overlaps the MID. Result is consistent with increased or decreased intention to smoke compared with the control group.
[3] Significant attrition (>50%) in all groups. Self-reported outcome measure could be subject to bias.

GRADE CERQual tables

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence in the evidence
1. Interactivity is important for online campaigns to prevent smoking uptake for young people. Older teenagers appreciate layers of information which can be explored. Initial messages should deliver instant impact.	Struik 2012	Minor concerns (limited reflexivity and little description of analysis process in one study)	No or minor concerns (there is good fit between the study and the review finding)	Serious concerns (moderately rich data from one study)	Moderate concerns (data is only partially relevant as covers only young women 16-19)	Low confidence
Supporting quotations: "When you're on Facebook, everything's really quick [and] gets at you right away. You want to get to that information as quick as possible, because you're not going to put a lot of time into looking at these." "I think including animation would make it stand out, because a lot of the side ads are still images and we ignore it — like, no one actually looks and reads it, but if the smoking ad is flashing or moving in some way, then people would be like, "Oh, what's that?" "Maybe something to grab your interest and then have a whole host of pages where you have information [and] you have some kind of interaction where you could post things or ask questions or something like that. Because if you just have one thing, then it doesn't give you anything so that you can do something with the information that you gather."						
2.	Struik 2012	Minor concerns	No or minor concerns	Serious concerns	Moderate concerns	Low confidence

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence in the evidence
Young women are uncomfortable with sexualisation of women in the campaigns directed at them. Heavy reliance on damage caused to physical appearance by smoking was seen as vain, and young women preferred to see characters they admired: women who were sophisticated, caring or actively engaging with life.		(limited reflexivity and no review of data by participants)	(there is good fit between the studies and the review finding)	(data from only one study with seven example interventions may not be generalisable)	(data is only partially relevant as covers only young women 16-19)	
Supporting quotations: “Put her in situations that we’d be in, as opposed to just standing there” “I think it’s important to bring that out and let smokers know that you are killing your friend, your family member, just people around you, so it’s not just about you.” “It’s just like every TV commercial, or something that has to do about women. It usually involves sex or looks, and that shouldn’t matter at all.” All participants agreed that portraying girls as “sex objects” did not “appeal” to them and detracted from a message’s effectiveness. Participants felt these ads would be “clicked on mostly by guys.” “Make it more about your life, not just vanity.” “I would look at this message, because, besides the cigarette, this girl is sophisticated and I would possibly strive to be more like her.”						
3. Although young women who smoked approved of fear-based images in print campaigns, both young women who smoked and did not smoke preferred positive message framing on social	Struik 2012	Minor concerns (limited reflexivity and no review of data by participants)	No or minor concerns (there is good fit between the studies and the review finding)	Serious concerns (data from only one study with seven example interventions may not be generalisable)	Moderate concerns (data is only partially relevant as covers only young women 16-19)	Low confidence

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence in the evidence
media. Emphasis on having a fresh start, and fulfilment without smoking appealed.						
Supporting quotations: In print, smoking participant: “I think that the scarier images are the more effective ones because they are, ultimately, more truthful. It’s not sugar-coated, it’s just, like, this is what’s going to happen.” In print, non-smoking participant: did not want to feel “scared” or “grossed-out”. On social media: “Push that you can get a fresh start.” “I think it would be a really effective way to advertise if the focus is [to show] that you can really have fun, have an active social life, and connect with your peers over things that are not smoking.”						
4. Young people do not trust all information on the internet and are more likely to trust legitimate-appearing material appearing in ‘safe areas’ such as embedded in trusted content, rather than in sidebars.	Struik 2012	Minor concerns (limited reflexivity and little description of analysis process in one study)	No or minor concerns (there is good fit between the study and the review finding)	Serious concerns (thin data from one study)	Moderate concerns (and data does not cover whole population of interest)	Very low confidence
Supporting quotations: “I just don’t know where [messages in the sidebar are] taking me, so I don’t go there, but if it was actually part of Facebook somehow, or just posted somewhere and a bunch of people were Liking it [and] it was being passed through the Walls, then I’d be more interested in it.”						

Matrix for integration of qualitative and effectiveness evidence

Quantitative outcomes	Related GRADE profile	Narrative exploration of qualitative review findings in relation to outcome
Non-smokers taking up smoking	1	The lack of effectiveness at preventing non-smokers taking up smoking could be due to insufficient interactivity or a reliance on fear-based messaging, although the study does not include sufficient information to determine whether this would be the case. Portrayal of women is unlikely to be relevant to this study, which is of younger children. Finally, a requirement for trust in the information presented is likely to be met by the intervention, which was a secure website requiring a log in.
Intention to smoke	2	As above.

Review B

Profile 3: Smoking initiation among children (Critical)

Quality assessment							No of patients		Effect		Confidence
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Self-help brochure	Telephone counselling	Relative (95% CI)	Absolute	
Smoking initiation among children at 30-month follow-up (follow-up mean 30 months; assessed with: Self-report questionnaire)											
1 Schuck 2015	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	34/256 (13.3%)	47/256 (18.4%)	RR 0.72 (0.48 to 1.09)	51 fewer per 1000 (from 95 fewer to 17 more)	⊕⊕OO LOW
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Children of parents who quit**	**Children of parents who did not quit**	**Relative (95% CI)**	**Absolute**	**Confidence**
Smoking initiation among children at 30-month follow-up (follow-up mean 30 months; assessed with: Self-report questionnaire)*											
1 Schuck 2015	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	9/84 (10.7%)	72/428 (16.8%)	RR 0.64 (0.33 to 1.22)	61 fewer per 1000 (from 113 fewer to 37 more)	⊕⊕OO LOW

[1] Outcome was self-reported so could be subject to bias. Attrition slightly larger in control group and outcome rare so could have introduced bias.
[2] CI crosses MID (line of no effect)

* This outcome compares children of parents who quit smoking (intervention group) vs children of parents who did not quit smoking (control). Secondary analysis conducted by paper authors.

Profile 4: Children's perceived safety of smoking (knowledge outcome) (Important)

Quality assessment							No of patients		Effect		Confidence
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Self-help brochure	Telephone counselling	Relative (95% CI)	Absolute**	
Perceived safety of smoking among children at 30-month follow-up (follow-up mean 30 months; measured with: Self-report questionnaire; range of scores: 1-4; Better indicated by lower values)											
1 Schuck 2015	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	256	256	-	MD 0.1 lower (0.25 lower to 0.05 higher)	⊕⊕OO LOW

[1] Outcome was self-reported so could be subject to bias. Attrition slightly larger in control group and outcome rare so could have introduced bias.
[2] CI overlaps the MID.
** Mean difference measures the absolute difference between the mean value in two groups. It estimates the amount by which the intervention changes the outcome on average compared with the control.

Profile 5: Children's self-efficacy (Important)

Quality assessment							No of patients		Effect		Confidence
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Self-help brochure	Telephone counselling	Relative (95% CI)	Absolute**	
Self-efficacy among children at 30-month follow-up (follow-up mean 30 months; measured with: Self-report questionnaire; range of scores: 1-6; Better indicated by higher values)											
1 Schuck 2015	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	256	256	-	MD 0.1 higher (0.04 lower to 0.24 higher)	⊕⊕OO LOW

[1] Outcome was self-reported so could be subject to bias. Attrition slightly larger in control group and outcome rare so could have introduced bias.
[2] CI overlaps the MID.
** Mean difference measures the absolute difference between the mean value in two groups. It estimates the amount by which the intervention changes the outcome on average compared with the control.

Profile 6: Children's susceptibility to smoking (Important)

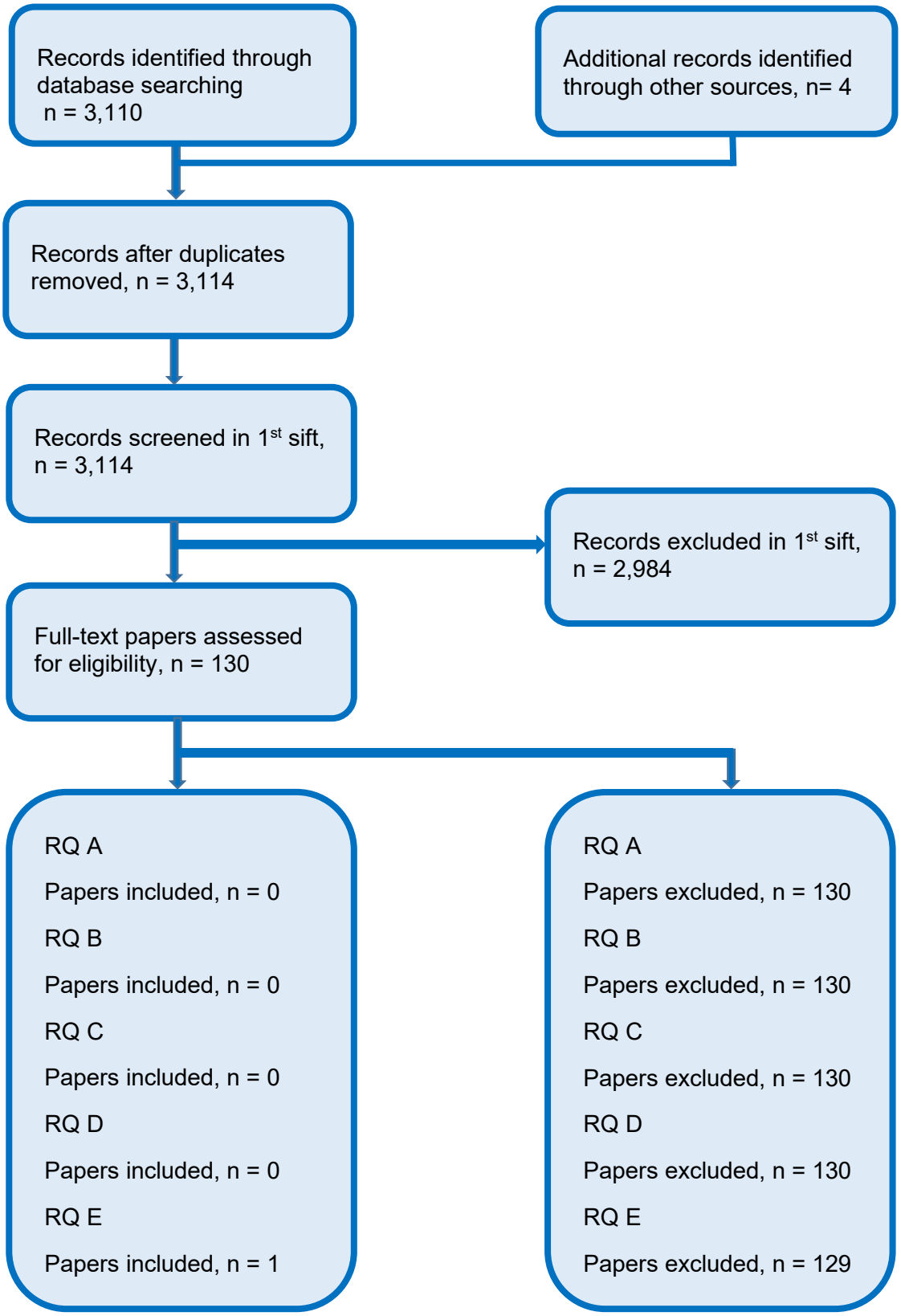
Quality assessment							No of patients		Effect		Confidence
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Self-help brochure	Telephone counselling	Relative (95% CI)	Absolute**	
Children's susceptibility to smoking at 30-month follow-up (follow-up mean 30 months; measured with: Self-report questionnaire; range of scores: 1-5; Better indicated by lower values)											
1 Schuck 2015	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	256	256	-	MD 1.0 lower (0.20 lower to 0.00 higher)	⊕⊕OO LOW

[1] Outcome was self-reported so could be subject to bias. Attrition slightly larger in control group and outcome rare so could have introduced bias.
[2] CI overlaps the MID
** Mean difference measures the absolute difference between the mean value in two groups. It estimates the amount by which the intervention changes the outcome on average compared with the control.

Appendix G – Economic evidence study selection

The following flowchart shows the record selection process for review questions A and B.

Figure 1: Flow chart of economic evidence study selection for the guideline



Appendix H – Economic evidence

No studies included for review questions A and B

Appendix I – Health economic analysis

Due to the paucity and quality of effectiveness evidence these review questions were not prioritised for economic modelling.

Appendix K – Excluded studies

Public health studies

Study Citation	Reason for excluding
Abroms Lorien C, Fagan Pebbles, Eisenberg Marla E, Lee Hye-Seung H, Remba Natania, and Sorensen Glorian (2004) The STRENGTH Ezine: an application of e-mail for health promotion in adolescent girls. American journal of health promotion : AJHP 19(1), 28-32	Exclude on intervention: not digital mass media intervention
Allen Jane Appleyard, Duke Jennifer C, Davis Kevin C, Kim Annice E, Nonnemaker James M, and Farrelly Matthew C (2015) Using mass media campaigns to reduce youth tobacco use: a review. American journal of health promotion : AJHP 30(2), e71-82	Systematic review: outcomes not relevant,
Anderson Christina, and Holody Kyle J (2013) Stimulating dialogue: measuring success of the "Smoke Free Horry" campaign. International quarterly of community health education 34(4), 331-49	Exclude on study design: survey
Anonymous (2007) Building a better youth antismoking campaign. CA Cancer Journal for Clinicians 57(6), 322-324	Exclude on evidence: narrative review
Badawy Sherif M, and Kuhns Lisa M (2017) Texting and Mobile Phone App Interventions for Improving Adherence to Preventive Behavior in Adolescents: A Systematic Review. JMIR mHealth and uHealth 5(4), e50	Exclude on intervention: not smoking related
Bannink Rienke, Broeren Suzanne, Joosten-van Zwanenburg, Evelien , van As , Els , van de Looij-Jansen , Petra , and Raat Hein (2014) Effectiveness of a Web-based tailored intervention (E-health4Uth) and consultation to promote adolescents' health: randomized controlled trial. Journal of medical Internet research 16(5), e143	Exclude on evidence: overall wellness intervention
Brinker Titus J, Holzapfel Julia, Baudson Tanja G, Sies Katharina, Jakob Lena, Baumert Hannah Maria, Heckl Marlene, Cirac Ana, Suhre Janina L, Mathes Verena, Fries Fabian N, Spielmann Hannah, Rigotti Nancy, Seeger Werner, Herth Felix, Groneberg David A, Raupach Tobias, Gall Henning, Bauer Claudia, Marek Pat, Batra Anil, Harrison Chase H, Taha Lava, Owczarek Andreas, Hofmann Felix J, Thomas Roger, Mons Ute, and Kreuter Michael (2016) Photoaging smartphone app promoting poster campaign to reduce smoking prevalence in secondary schools: the Smokerface Randomized Trial: design and baseline characteristics. BMJ open 6(11), e014288	Exclude on evidence: not delivered through digital mass media
Brown Whitney N (2018) The adolescent smoking prevention project: A web-based smoking prevention for adolescents. Dissertation Abstracts International: Section B: The Sciences and Engineering 78(8-B(E)), No-Specified	Exclude on evidence: not a peer reviewed RCT
Buller D, Borland R, Woodall G, Hall J, Hines J, Burris-Woodall P, Cutter G, Miller C, Balmford J, Starling R, and et al (2005) Randomized trials on 'Consider This', an internet smoking prevention program for adolescents. Society for research on nicotine and tobacco 11th annual meeting, 20-23 march 2005, prague, and czech republic ,	Exclude on evidence: not digital mass media
Cameron David, Epton Tracy, Norman Paul, Sheeran Paschal, Harris Peter R, Webb Thomas L, Julious Steven A, Brennan Alan, Thomas Chloe, Petroczi Andrea, Naughton Declan, and Shah Iltaf (2015) A theory-based online health behaviour intervention for new university	Exclude on evidence: overall health lifestyle promotion

students (U@Uni:LifeGuide): results from a repeat randomized controlled trial. Trials 16, 555	
Coleman T, and Bauld L (2011) Preventing adolescents' uptake of smoking. Thorax 66(10), 842-844	Exclude on evidence: editorial
Connolly G N (2000) Mass media campaigns: Australia, UK, USA. Tobacco Control 9(2), 234-235	Exclude on evidence: abstract
Connors Kara, Connors Kelley, and Bernstein Hank (2010) Innovative online smoking prevention education for pediatric providers, 'tween' girls, and their families. Journal of Communication In Healthcare 3(1), 9-16	Exclude on evidence: discussion/opinion paper
Cowell Alexander J, Farrelly Matthew C, Chou Rosaleen, and Vallone Donna M (2009) Assessing the impact of the national 'truth' antismoking campaign on beliefs, attitudes, and intent to smoke by race/ethnicity. Ethnicity & health 14(1), 75-91	Exclude on study design: survey
Davis Kevin C, Farrelly Matthew C, Messeri Peter, and Duke Jennifer (2009) The impact of national smoking prevention campaigns on tobacco-related beliefs, intentions to smoke and smoking initiation: results from a longitudinal survey of youth in the United States. International journal of environmental research and public health 6(2), 722-40	Exclude on intervention: not digital
Debevec Kathleen, and Diamond William D (2012) Social smokers: Smoking motivations, behavior, vulnerability, and responses to antismoking advertising. Journal of Consumer Behaviour 11(3), 207-216	Exclude on intervention: not prevention
Devlin Elinor, Eadie Douglas, Stead Martine, and Evans Kirsty (2007) Comparative study of young people's response to anti-smoking messages. International Journal of Advertising: The Quarterly Review of Marketing Communications 26(1), 99-128	Exclude on intervention: not digital
Dijkstra M, Mesters I, De Vries , H , van Breukelen , G , and Parcel G S (1999) Effectiveness of a social influence approach and boosters to smoking prevention. Health education research 14(6), 791-802	Exclude on date
Duke Jennifer C, Alexander Tesfa N, Zhao Xiaoquan, Delahanty Janine C, Allen Jane A, MacMonegle Anna J, and Farrelly Matthew C (2015) Youth's Awareness of and Reactions to The Real Cost National Tobacco Public Education Campaign. PloS one 10(12), e0144827	Exclude on evidence: not digital
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Evans W Douglas, Renaud Jeanette, Blitstein Jonathan, Hersey James, Ray Sarah, Schieber Beth, and Willett Jeff (2007) Prevention effects of an anti-tobacco brand on adolescent smoking initiation. Social Marketing Quarterly 13(2), 2-20	Exclude on study design: survey
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Hopson Laura, Wodarski John, and Tang Ning (2015) The effectiveness of electronic approaches to substance abuse prevention for adolescents. Journal of evidence-informed social work 12(3), 310-22	Exclude on study design: narrative review
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Jacobs Megan A, Cha Sarah, Villanti Andrea C, and Graham Amanda L (2016) Using Tumblr to Reach and Engage Young Adult Smokers: A Proof of Concept in Context. American journal of health behavior 40(1), 48-54	Exclude on evidence: not prevention
Kalkhoran Sara, Lisha Nadra E, Neilands Torsten B, Jordan Jeffrey W, and Ling Pamela M (2016) Evaluation of Bar and Nightclub Intervention to Decrease Young Adult Smoking in New Mexico. The Journal of adolescent health : official publication of the Society for Adolescent Medicine 59(2), 222-9	Exclude on study design: cross sectional surveys
Kandra Kelly L (2007) An evaluation of the North Carolina Tobacco.Reality.Unfiltered. Media Campaign. Dissertation Abstracts International: Section B: The Sciences and Engineering 68(6-B), 4119	Exclude on intervention: non digital
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Kranzler Elissa C, Gibson Laura A, and Hornik Robert C (2017) Recall of "The Real Cost" Anti-Smoking Campaign Is Specifically Associated With Endorsement of Campaign-Targeted Beliefs. Journal of health communication 22(10), 818-828	Exclude on intervention: non digital

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McAfee Tim, Davis Kevin C, Alexander Robert L, Jr , Pechacek Terry F, and Bunnell Rebecca (2013) Effect of the first federally funded US antismoking national media campaign. Lancet (London, and England) 382(9909), 2003-11	Exclude on study design: not RCT or qualitative
McClure Erin, Baker Nathaniel, Carpenter Matthew J, Treiber Frank A, and Gray Kevin (2017) Attitudes and interest in technology-based treatment and the remote monitoring of smoking among adolescents and emerging adults. Journal of smoking cessation 12(2), 88-98	Exclude on intervention::not a campaign
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McGee Ciara E, Trigwell Joanne, Fairclough Stuart J, Murphy Rebecca C, Porcellato Lorna, Ussher Michael, and Foweather Lawrence (2016) Effect of a sport-for-health intervention (SmokeFree Sports) on smoking-related intentions and cognitions among 9-10 year old primary school children: a controlled trial. BMC public health 16, 445	Exclude on study design: not digital
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Meshack A. F., Hu S., Pallonen U. E et al., 2004. Texas Tobacco Prevention Pilot Initiative: processes and effects. Health education research 19 (6): 657-688.	Exclude on study design: not RCT or qualitative
Mussener Ulrika, Bendtsen Marcus, McCambridge Jim, and Bendtsen Preben (2016) User satisfaction with the structure and content of the NEXit intervention, a text messaging-based smoking cessation programme. BMC public health 16(1), 1179	Exclude on intervention: not prevention
Namkoong Kang, Nah Seungahn, Record Rachael A, Van Stee , and Stephanie K (2017) Communication, Reasoning, and Planned Behaviors: Unveiling the Effect of Interactive Communication in an Anti-Smoking Social Media Campaign. Health communication 32(1), 41-50	Exclude on evidence: framework development
Nasim Aashir, and Corona Rosalie (2008) Does the source matter in the communication of anti-smoking messages to youth?. International quarterly of community health education 29(4), 309-21	Exclude on study design: survey
Nixon Charisse L, Mansfield Phylis M, and Thoms Peg (2008) Effectiveness of antismoking public service announcements on children's intent to smoke. Psychology of addictive behaviors : journal of the Society of Psychologists in Addictive Behaviors 22(4), 496-503	Exclude on intervention: not digital
Norman Cameron D, and Skinner Harvey A (2007) Engaging youth in e-health promotion: lessons learned from a decade of TeenNet research. Adolescent medicine: state of the art reviews 18(2), 357-xii	Exclude on evidence: case study
Parlove AE, Cowdery JE, Hoerauf SL (2004) Acceptability and appeal of a Web-based smoking prevention intervention for adolescents. International Electronic Journal of Health Education, 7: 1-8.	Exclude on date
Park Eunhee, and Drake Emily (2015) Systematic review: internet-based program for youth smoking prevention and cessation. Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing 47(1), 43-50	Exclude on intervention: systematic review mainly on cessation, references checked

Perusco Andrew, Poder Natasha, Mohsin Mohammed, Rikard-Bell Glenys, Rissel Chris, Williams Mandy, Hua Myna, Millen Elizabeth, Sabry Marial, and Guirguis Sanaa (2010) Evaluation of a comprehensive tobacco control project targeting Arabic-speakers residing in south west Sydney, Australia. Health promotion international 25(2), 153-65	Exclude on evidence: surveys
Rath Jessica M, Williams Valerie, Rubenstein Rebecca, Smith Lexi, and Vallone Donna (2015) Assessing the Impact of an Interactive Mobile Game on Tobacco-Related Attitudes and Beliefs: The Truth Campaign's "Flavor Monsters". Games for health journal 4(6), 480-7	Exclude on intervention: not mass media
Reinwand Dominique A, Crutzen Rik, Kienhuis Anne S, Talhout Reinskje, de Vries , and Hein (2017) Website Use and Effects of Online Information About Tobacco Additives Among the Dutch General Population: A Randomized Controlled Trial. Journal of medical Internet research 19(3), e60	Exclude on evidence: not children and young people prevention
Richardson Amanda Kalaydjian, Green Molly, Xiao Haijun, Sokol Natasha, and Vallone Donna (2010) Evidence for truth: the young adult response to a youth-focused anti-smoking media campaign. American journal of preventive medicine 39(6), 500-6	Exclude on intervention: not digital
Richardson R, and Sowden A (2000) Preventing the uptake of smoking in young people. Nursing Times 96(9), 43-44	Exclude on evidence: narrative review
Rigotti N A, and Wakefield M (2012) Real People, Real Stories: A New Mass Media Campaign That Could Help Smokers Quit. Annals of Internal Medicine 157(12), 907-U125	Exclude on evidence: opinion paper
Schwartz Jennifer, Bottorff Joan L, Ratner Pamela A, Gotay Carolyn, Johnson Kenneth C, Memetovic Jasmina, and Richardson Chris G (2014) Effect of web-based messages on girls' knowledge and risk perceptions related to cigarette smoke and breast cancer: 6-month follow-up of a randomized controlled trial. JMIR research protocols 3(3), e53	Exclude on evidence: not prevention
Seghers T, and Foland S (1998) Anti-tobacco media campaign for young people. Tobacco control 7 Suppl, S29-5	Exclude on intervention: summary of campaigns
Silver M Z (2001) Efficacy of anti-tobacco mass media campaigns on adolescent tobacco use. Pediatric nursing 27(3), 293-6	Exclude on evidence: narrative review
Sims M, Langley T, Lewis S, Richardson S, Szatkowski L, McNeill A, and Gilmore A B (2016) Effectiveness of tobacco control television advertisements with different types of emotional content on tobacco use in England, 2004-2010. Tobacco control 25(1), 21-6	Exclude on evidence: cross sectional surveys
Skinner Harvey, Maley Oonagh, Smith Louise, Chirrey Shawn, and Morrison Meg (2001) New frontiers: Using the Internet to engage teens in substance abuse prevention and treatment. Adolescents, alcohol, and substance abuse: Reaching teens through brief interventions. , 297-318	Exclude on evidence: communications project
Sly David F, Trapido Ed, and Ray Sarah (2002) Evidence of the dose effects of an antitobacco counteradvertising campaign. Preventive medicine 35(5), 511-8	Exclude on intervention: not digital
Smith Karen H, and Stutts Mary Ann (2003) Effects of short-term cosmetic versus long-term health fear appeals in anti-smoking advertisements on the smoking behaviour of adolescents. Journal of Consumer Behaviour 3(2), 157-177	Exclude on study design: not an RCT or qualitative study
Sutfin Erin Lynne (2006) Adolescents' responses to anti-tobacco advertising: Exploring the role of advertisement theme and adolescents' emotional responses and smoking status. Dissertation Abstracts International: Section B: The Sciences and Engineering 67(6-B), 3488	Exclude on study design: cross sectional

Wakefield Melanie, Flay Brian, Nichter Mark, and Giovino Gary (2003) Effects of anti-smoking advertising on youth smoking: a review. Journal of health communication 8(3), 229-47	Exclude on study design: narrative review
White V, Tan N, Wakefield M, and Hill D (2003) Do adult focused anti-smoking campaigns have an impact on adolescents? The case of the Australian National Tobacco Campaign. Tobacco control 12 Suppl 2, ii23-9	Exclude on study design: surveys
White Victoria M, Durkin Sarah J, Coomber Kerri, and Wakefield Melanie A (2015) What is the role of tobacco control advertising intensity and duration in reducing adolescent smoking prevalence? Findings from 16 years of tobacco control mass media advertising in Australia. Tobacco control 24(2), 198-204	Exclude on intervention: not digital
Yoo Woohyun, Yang JungHwan, and Cho Eunji (2016) How social media influence college students' smoking attitudes and intentions. Computers in human behavior 64, 173-182	Exclude on study design: survey
Zhao Guangzhi, and Pechmann Cornelia (2007) The impact of regulatory focus on adolescents' response to antismoking advertising campaigns. Journal of Marketing Research 44(4), 671-687	Exclude on intervention: about regulatory focus on campaigns
Zhao Xiaoquan, and Cai Xiaomei (2016) The association between exposure to "Tips" and smoking-related outcomes among adolescents in the United States. Health education research 31(5), 614-23	Exclude on study design: survey

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Study Citation
Allen Jane Appleyard, Duke Jennifer C, Davis Kevin C, Kim Annice E, Nonnemaker James M, and Farrelly Matthew C (2015) Using mass media campaigns to reduce youth tobacco use: a review. American journal of health promotion : AJHP 30(2), e71-82
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Gulliver Amelia, Farrer Louise, Chan Jade K. Y, Tait Robert J, Bennett Kylie, Calear Alison L, and Griffiths Kathleen M (2015) Technology-based interventions for tobacco and other drug use in university and college students: a systematic review and meta-analysis. Addiction science & clinical practice 10, 5
Mosdol Annhild, Lidal Ingeborg B, Straumann Gyri H, and Vist Gunn E (2017) Targeted mass media interventions promoting healthy behaviours to reduce risk of non-communicable diseases in adult, ethnic minorities. The Cochrane database of systematic reviews 2, CD011683
Park Eunhee, and Drake Emily (2015) Systematic review: internet-based program for youth smoking prevention and cessation. Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing 47(1), 43-50

Economic studies

Reference	Reason for exclusion	RQs
Ahmad S. Closing the youth access gap: The projected health benefits and cost savings of a national policy to raise the legal smoking age to 21 in the United States. Health Policy. 2005;75(1):74-84.	Ineligible intervention	A, B, C, D, E
Ahmad S. The cost-effectiveness of raising the legal smoking age in California. Med Decis Making. 2005;25(3):330-40.	Ineligible intervention	A, B, C, D, E
ASH. Cost benefit analysis of the FCTC protocol on illicit trade in tobacco products. 2009. Available from: http://ash.org.uk/information-and-resources/reports-submissions/reports/cost-benefit-analysis-of-the-fctc-protocol-on-illicit-trade-in-tobacco-products/	Ineligible patient population	A, B, C, D, E
Ashley EM, Nardinelli C, Lavaty RA. Estimating the benefits of public health policies that reduce harmful consumption. Health Econ. 2015;24(5):617-24.	Ineligible intervention	A, B, C, D, E
Atusingwize E, Lewis S, Langley T. Economic evaluations of tobacco control mass media campaigns: A systematic review. Tob Control. 2015;24(4):320-27.	Ineligible study design	A, B, C, D, E
Bains N, Pickett W, Hoey J. The use and impact of incentives in population-based smoking cessation programs: A review. American journal of health promotion : AJHP. 1998;12(5):307-20.	Ineligible study design	A, B, C, D, E
Beltramini RF, Bridge PD. Relationship between tobacco advertising and youth smoking: Assessing the effectiveness of a school-based, antismoking intervention program. J Consum Aff. 2001;35(2):263-77.	Ineligible outcomes	A, B, C, D, E
Berrios X, Bedregal P, Guzman B. Cost-effectiveness of health promotion in Chile: Experience with "Mirame!" program. Rev Med Chil. 2004;132(3):361-70.	Ineligible intervention	A, B, C, D, E
Blyth A, Maskrey V, Notley C, Barton GR, Brown TJ, Aveyard P, et al. Effectiveness and economic evaluation of self-help educational materials for the prevention of smoking relapse: Randomised controlled trial. Health Technol Assess. 2015;19(59)	Ineligible intervention	A, B, C, D, E
Bold KW, Hanrahan TH, O'Malley SS, Fucito LM. Exploring the utility of web-based social media advertising to recruit adult heavy-drinking smokers for treatment. J Med Internet Res. 2016;18(5):e107.	Ineligible outcomes	A, B, C, D, E
Brown, Kotz, Michie, Stapleton, Walmsley, West. How effective and cost-effective was the national mass media smoking cessation campaign 'stoptober'? Drug Alcohol Depend. 2013;135:52-58.	Ineligible intervention	A, B, C, D, E
Brown HS, Stigler M, Perry C, Dhavan P, Arora M, Reddy KS. The cost-effectiveness of a school-based smoking prevention program in India. Health Promot Int. 2013;28(2):178-86.	Ineligible intervention	A, B, C, D, E
Brubach AL. The case and context for "The Real Cost" campaign. Am J Prev Med. 2019;56(2S1):S5-S8.	Ineligible outcomes	A, B, C, D, E

Reference	Reason for exclusion	RQs
Burford O, Jiwa M, Carter O, Parsons R, Hendrie D. Internet-based photoaging within Australian pharmacies to promote smoking cessation: Randomized controlled trial. J Med Internet Res. 2013;15(3):e64.	Ineligible intervention	A, B, C, D, E
Campbell R, Starkey F, Holliday J, Audrey S, Bloor M, Parry-Langdon N, et al. An informal school-based peer-led intervention for smoking prevention in adolescence (ASSIST): A cluster randomised trial. Lancet. 2008;371(9624):1595-602.	Ineligible intervention	A, B, C, D, E
Cha S, Ganz O, Cohn AM, Ehlke SJ, Graham AL. Feasibility of biochemical verification in a web-based smoking cessation study. Addict Behav. 2017;73:204-08.	Ineligible intervention	A, B, C, D, E
Chaiton MO, Mecredy GC, Cohen JE, Tilson ML. Tobacco retail outlets and vulnerable populations in Ontario, Canada. IJERGQ. 2013;10(12):7299-309.	Ineligible outcomes	A, B, C, D, E
Chaloupka FJ, Jha P, de Beyer J, Heller P. The economics of tobacco control. BNE. 2004;0(63):1-9.	Ineligible outcomes	A, B, C, D, E
Chen YF, Madan J, Welton N, Yahaya I, Aveyard P, Bauld L, et al. Effectiveness and cost-effectiveness of computer and other electronic aids for smoking cessation: A systematic review and network meta-analysis. Health Technol Assess. 2012;16(38):1-v.	Ineligible intervention	A, B, C, D, E
Cheung KL, Wijnen B, de Vries H. A Review of the Theoretical Basis, Effects, and Cost Effectiveness of Online Smoking Cessation Interventions in the Netherlands: A Mixed-Methods Approach. J Med Internet Res. 2017;19(6):e230.	Ineligible study design	A, B, C, D, E
Clayforth C, Pettigrew S, Mooney K, Lansdorp-Vogelaar I, Rosenberg M, Slevin T. A cost-effectiveness analysis of online, radio and print tobacco control advertisements targeting 25-39 year-old males. Aust N Z J Public Health. 2014;38(3):270-74.	Ineligible intervention	A, B, C, D, E
Cole S, Suter C, Nash C, Pollard J. Impact of a temporary NRT enhancement in a state quitline and web-based program. Am J Health Promot. 2018;32(5):1206-13.	Ineligible intervention	A, B, C, D, E
Coleman T, Agboola S, Leonardi-Bee J, Taylor M, McEwen A, McNeill A. Relapse prevention in UK Stop Smoking Services: Current practice, systematic reviews of effectiveness and cost-effectiveness analysis. Health Technol Assess. 2010;14(49):1-181.	Ineligible intervention	A, B, C, D, E
Cotter T, Hung WT, Perez D, Dunlop S, Bishop J. Squeezing new life out of an old Sponge: how to modernise an anti-smoking media campaign to capture a new market. Aust N Z J Public Health. 2011;35(1):75-80.	Ineligible outcomes	A, B, C, D, E
Dallery J, Meredith S, Jarvis B, Nuzzo PA. Internet-based group contingency management to promote smoking abstinence. Exp Clin Psychopharmacol. 2015;23(3):176-83.	Ineligible patient population	A, B, C, D, E
DiFranza JR, Peck RM, Radecki TE, Savageau JA. What is the potential cost-effectiveness of enforcing a prohibition on the sale of tobacco to minors? Prev Med. 2001;32(2):168-74.	Ineligible intervention	A, B, C, D, E

Reference	Reason for exclusion	RQs
DiFranza JR, Savageau JA, Fletcher KE. Enforcement of underage sales laws as a predictor of daily smoking among adolescents: A national study. BMC Public Health. 2009;9:107.	Ineligible outcomes	A, B, C, D, E
Dobbie F, Hiscock R, Leonardi-Bee J, Murray S, Shahab L, Aveyard P, et al. Evaluating Long-term Outcomes of NHS Stop Smoking Services (ELONS): A prospective cohort study. Health Technol Assess. 2015;19(95)	Ineligible outcomes	A, B, C, D, E
Eddy DM, Peskin B, Shcheprov A, Pawlson G, Shih S, Schaaf D. Effect of smoking cessation advice on cardiovascular disease. Am J Med Qual. 2009;24(3):241-49.	Ineligible intervention	A, B, C, D, E
Fellows JL, Bush T, McAfee T, Dickerson J. Cost effectiveness of the Oregon quitline "free patch initiative". Tob Control. 2007;16(Suppl 1):I47-I52.	Ineligible intervention	A, B, C, D, E
Fishman PA, Ebel BE, Garrison MM, Christakis DA, Wiehe SE, Rivara FP. Cigarette tax increase and media campaign cost of reducing smoking-related deaths. Am J Prev Med. 2005;29(1):19-26.	Ineligible intervention	A, B, C, D, E
Fleischer NL, Thrasher JF, Reynales-Shigematsu LM, Cummings KM, Meza R, Zhang Y, et al. Mexico SimSmoke: How changes in tobacco control policies would impact smoking prevalence and smoking attributable deaths in Mexico. Glob Public Health. 2017;12(7):830-45.	Ineligible outcomes	A, B, C, D, E
Froelicher ES, Sohn M, Max W, Bacchetti P. Women's initiative for nonsmoking - VII: Evaluation of health service utilization and costs among women smokers with cardiovascular disease. J Cardpulm Rehabil. 2004;24(4):218-28.	Ineligible patient population	A, B, C, D, E
Gao K, Wiederhold MD, Kong L, Wiederhold BK. Clinical experiment to assess effectiveness of virtual reality teen smoking cessation program. Stud Health Technol Inform. 2013;191:58-62.	Ineligible outcomes	A, B, C, D, E
Graham AL, Chang Y, Fang Y, Cobb NK, Tinkelman D, S., Niaura R, S., et al. Cost-effectiveness of internet and telephone treatment for smoking cessation: An economic evaluation of The iQUITT Study. Tob Control. 2013;22(6):1-7.	Ineligible intervention	A, B, C, D, E
Graham AL, Fang Y, Moreno JL, Streiff SL, Villegas J, Munoz RF, et al. Online advertising to reach and recruit Latino smokers to an internet cessation program: Impact and costs. J Med Internet Res. 2012;14(4):e116.	Ineligible intervention	A, B, C, D, E
Graham AL, Milner P, Saul JE, Pfaff L. Online advertising as a public health and recruitment tool: Comparison of different media campaigns to increase demand for smoking cessation interventions. J Med Internet Res. 2008;10(5):e50.	Ineligible intervention	A, B, C, D, E
Halpin HA, McMenamin SB, Rideout J, Boyce-Smith G. The costs and effectiveness of different benefit designs for treating tobacco dependence: Results from a randomized trial. Inquiry. 2006;43(1):54-65.	Ineligible intervention	A, B, C, D, E
Higashi H, Truong KD, Barendregt JJ, Nguyen PK, Vuong ML, Nguyen TT, et al. Cost effectiveness of tobacco control policies in Vietnam: The case of population-level interventions. Appl Health Econ Health Policy. 2011;9(3):183-96.	Ineligible patient population	A, B, C, D, E

Reference	Reason for exclusion	RQs
Hill A. A cost-effectiveness evaluation of single and combined smoking cessation interventions in Texas. Tex Med. 2006;102(8):50-55.	Ineligible intervention	A, B, C, D, E
Hoeflmayr D, Hanewinkel R. Do school-based tobacco prevention programmes pay off? The cost-effectiveness of the 'Smoke-free Class Competition'. Public Health. 2008;122(1):34-41.	Ineligible outcomes	A, B, C, D, E
Hollingworth W, Cohen D, Hawkins J, Hughes RA, Moore LAR, Holliday JC, et al. Reducing smoking in adolescents: Cost-effectiveness results from the cluster randomized assist (a stop smoking in schools trial). Nicotine Tob Res 2012;14(2):161-68.	Ineligible intervention	A, B, C, D, E
Hollis JF, McAfee TA, Fellows JL, Zbikowski SM, Stark M, Riedlinger K. The effectiveness and cost effectiveness of telephone counselling and the nicotine patch in a state tobacco quitline. Tob Control. 2007;16(Suppl 1):i53-i59.	Ineligible patient population	A, B, C, D, E
Holtgrave DR, Wunderink KA, Vallone DM, Healton CG. Cost-utility analysis of the National Truth Campaign to prevent youth smoking. Am J Prev Med. 2009;36(5):385-8.	Ineligible intervention	A, B, C, D, E
Hurley SF, Matthews JP. Cost-effectiveness of the Australian National Tobacco Campaign. Tob Control. 2008;17(6):379-84.	Ineligible patient population	A, B, C, D, E
Ip P, Lam T-H, Chan SS-C, Ho FK-W, Lo LA, Chiu IW-S, et al. Use of Internet viral marketing to promote smoke-free lifestyles among Chinese adolescents. PLoS ONE. 2014;9(6):e99082.	Ineligible outcomes	A, B, C, D, E
Jha P, Chaloupka FJ, Moore J, Gajalakshmi V, Gupta PC, Peck R, et al. Tobacco Addiction. 2006	Ineligible intervention	A, B, C, D, E
Johansson PM, Tillgren PE, Guldbrandsson KA, Lindholm LA. A model for cost-effectiveness analyses of smoking cessation interventions applied to a quit-and-win contest for mothers of small children. Scand J Public Health. 2005;33:343-52.	Ineligible intervention	A, B, C, D, E
Kahende JW, Loomis BR, Adhikari B, Marshall L. A review of economic evaluations of tobacco control programs. IJERGQ. 2009;6(1):51-68.	Ineligible study design	A, B, C, D, E
Katzman B, Markowitz S, McGeary KA. The impact of lending, borrowing, and anti-smoking policies on cigarette consumption by teens. 2002	Ineligible outcomes	A, B, C, D, E
Kruger J, Brennan A, Strong M, Thomas C, Norman P, Epton T. The cost-effectiveness of a theory-based online health behaviour intervention for new university students: An economic evaluation. BMC Public Health. 2014;14:1011.	Ineligible outcomes	A, B, C, D, E
Kuklinski, Margaret R, Briney, John S, Hawkins, J D, et al. Cost-benefit analysis of communities that care outcomes at eighth grade. Prev Sci. 2012;13(2):150-61.	Ineligible intervention	A, B, C, D, E
Lai T, Habicht J, Reinap M, Chisholm D, Baltussen R. Costs, health effects and cost-effectiveness of alcohol and tobacco control strategies in Estonia. Health Policy. 2007;84:75-88.	Ineligible intervention	A, B, C, D, E

Reference	Reason for exclusion	RQs
Lantz PM, Jacobson PD, Warner KE, Wasserman J, Pollack HA, Berson J, et al. Investing in youth tobacco control: A review of smoking prevention and control strategies. Tob Control. 2000;9(1):47-63.	Ineligible outcomes	A, B, C, D, E
Leao T, Kunst AE, Perelman J. Cost-effectiveness of tobacco control policies and programmes targeting adolescents: A systematic review. Eur J Public Health. 2018;28(1):39-43.	Ineligible study design	A, B, C, D, E
Lightwood J. The economics of smoking and cardiovascular disease. Prog Cardiovasc Dis. 2003;46(1):39-78.	Ineligible outcomes	A, B, C, D, E
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McAfee TA, Bush T, Deprey TM, Mahoney LD, Zbikowski SM, Fellows JL, et al. Nicotine patches and uninsured quitline callers: A randomized trial of two versus eight weeks. Am J Prev Med. 2008;35(2):103-10.	Ineligible intervention	A, B, C, D, E
McAlister AL, Rabius V, Geiger A, Glynn TJ, Huang P, Todd R. Telephone assistance for smoking cessation: One year cost effectiveness estimations. Tob Control. 2004;13(1):85-86.	Ineligible intervention	A, B, C, D, E
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Miller LS, Max W, Sung HY, Rice D, Zaretsky M. Evaluation of the economic impact of California's Tobacco Control Program: A dynamic model approach. Tob Control. 2010;19(Suppl 1):i68-i76.	Ineligible intervention	A, B, C, D, E
Mosbaek CH, Austin DF, Stark MJ, Lambert LC. The association between advertising and calls to a tobacco quitline. Tob Control. 2007;16(Suppl 1):I24-I29.	Ineligible intervention	A, B, C, D, E
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Ngalesoni F, Ruhago G, Mayige M, Oliveira TC, Robberstad B, Norheim OF, et al. Cost-effectiveness analysis of population-based tobacco control strategies in the prevention of cardiovascular diseases in Tanzania. PLoS ONE. 2017;12(8):e0182113.	Ineligible intervention	A, B, C, D, E
Nghiem N, Cleghorn CL, Leung W, Nair N, Deen FSvd, Blakely T, et al. A national quitline service and its promotion in the mass	Ineligible intervention	A, B, C, D, E

Reference	Reason for exclusion	RQs
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Nishio A, Saito J, Tomokawa S, Kobayashi J, Makino Y, Akiyama T, et al. Systematic review of school tobacco prevention programs in African countries from 2000 to 2016. PLoS ONE. 2018;13(2):e0192489.	Ineligible study design	A, B, C, D, E
O'Connor R, Fix B, Celestino P, Carlin-Menter S, Hyland A, Cummings KM. Financial incentives to promote smoking cessation: Evidence from 11 quit and win contests. JPHMP. 2006;12(1):44-51.	Ineligible intervention	A, B, C, D, E
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Oncken CA, Dietz PM, Tong VT, Belizan JM, Tolosa JE, Berghella V, et al. Prenatal tobacco prevention and cessation interventions for women in low- and middle-income countries. Acta Obstet Gynecol Scand. 2010;89(4):442-53.	Ineligible outcomes	A, B, C, D, E
Ong MK, Glantz SA. Cardiovascular health and economic effects of smoke-free workplaces. Am J Med. 2004;117(1):32-38.	Ineligible intervention	A, B, C, D, E
Paech D, Mernagh P, Weston A. A systematic review of economic evaluations for tobacco control programs. Health Services Assessment Collaboration; 22 Dec 2010 2010. Available from: http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?ID=32010001693.	Ineligible study design	A, B, C, D, E
Parker DR, Windsor RA, Roberts MB, Hecht J, Hardy NV, Strolla LO, et al. Feasibility, cost, and cost-effectiveness of a telephone-based motivational intervention for underserved pregnant smokers. Nicotine Tob Res 2007;9(10):1043-51.	Ineligible intervention	A, B, C, D, E
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Pearson AL, van der Deen FS, Wilson N, Cobiac L, Blakely T. Theoretical impacts of a range of major tobacco retail outlet reduction interventions: modelling results in a country with a smoke-free nation goal. Tob Control. 2015;24(e1):e32-8.	Ineligible outcomes	A, B, C, D, E
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Pifarre M, Carrera A, Vilaplana J, Cuadrado J, Solsona S, Abella F, et al. TControl: A mobile app to follow up tobacco-quitting patients. Comput Methods Programs Biomed. 2017;142:81-89.	Ineligible intervention	A, B, C, D, E
Popp J, Nyman JA, Luo X, Bengtson J, Lust K, An L, et al. Cost-effectiveness of enhancing a Quit-and-Win smoking cessation program for college students. Eur J Health Econ. 2018;19(9):1319-33.	Ineligible intervention	A, B, C, D, E
Prenger R, Pieterse ME, Braakman-Jansen LM, van der Palen J, Christenhusz LC, Seydel ER. Moving beyond a limited follow-up in cost-effectiveness analyses of behavioral interventions. Eur J Health Econ. 2013;14(2):297-306.	Ineligible intervention	A, B, C, D, E
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Rait MA, Prochaska JJ, Rubinstein ML. Recruitment of adolescents for a smoking study: Use of traditional strategies and social media. Transl Behav Med. 2015;5(3):254-9.	Ineligible intervention	A, B, C, D, E
Ramirez AG, Chalela P, Akopian D, Munoz E, Gallion KJ, Despres C, et al. Text and mobile media smoking cessation service for young adults in South Texas: Operation and cost-effectiveness estimation. Health Promot Pract. 2017;18(4):581-85.	Ineligible intervention	A, B, C, D, E
Ranson MK, Jha P, Chaloupka FJ, Nguyen SN. Global and regional estimates of the effectiveness and cost-effectiveness of price increases and other tobacco control policies. Nicotine Tob Res 2002;4(3):311-19.	Ineligible intervention	A, B, C, D, E
Rasmussen SR. The cost effectiveness of telephone counselling to aid smoking cessation in Denmark: A modelling study. Scand J Public Health. 2013;41(1):4-10.	Ineligible patient population	A, B, C, D, E
Rigotti NA. Youth access to tobacco. Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco. 1999;1 (Suppl 2):S93-7.	Ineligible study design	A, B, C, D, E
Rigotti NA, Bitton A, Kelley JK, Hoeppner BB, Levy DE, Mort E. Offering population-based tobacco treatment in a healthcare setting: A randomized controlled trial. Am J Prev Med. 2011;41(5):498-503.	Ineligible patient population	A, B, C, D, E
Ross H, Powell LM, Bauer JE, Levy DT, Peck RM, Lee H-R. Community-based youth tobacco control interventions: Cost effectiveness of the Full Court Press project. Appl Health Econ Health Policy. 2006;5(3):167-76.	Ineligible intervention	A, B, C, D, E

Reference	Reason for exclusion	RQs
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Sanders AE, Slade GD, Ranney LM, Jones LK, Goldstein AO. Valuation of tobacco control policies by the public in North Carolina: Comparing perceived benefit with projected cost of implementation. N C Med J. 2012;73(6):439-47.	Ineligible intervention	A, B, C, D, E
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Schauffler HH, McMenamin S, Olson K, Boyce-Smith G, Rideout JA, Kamil J. Variations in treatment benefits influence smoking cessation: results of a randomised controlled trial. Tob Control. 2001;10(2):175-80.	Ineligible intervention	A, B, C, D, E
Schmidt AM, Ranney LM, Goldstein AO. Communicating program outcomes to encourage policymaker support for evidence-based state tobacco control. IJERGQ. 2014;11(12):12562-74.	Ineligible intervention	A, B, C, D, E
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Schulz DN, Smit ES, Stanczyk NE, Kremers SP, de Vries H, Evers SM. Economic evaluation of a web-based tailored lifestyle intervention for adults: Findings regarding cost-effectiveness and cost-utility from a randomized controlled trial. J Med Internet Res. 2014;16(3):e91.	Ineligible intervention	A, B, C, D, E
Secker-Walker RH, Holland RR, Lloyd CM, Pelkey D, Flynn BS. Cost effectiveness of a community based research project to help women quit smoking. Tob Control. 2005;14:37-42.	Ineligible intervention	A, B, C, D, E
Secker-Walker RH, Worden JK, Holland RR, Flynn BS, Detsky AS. A mass media programme to prevent smoking among adolescents: Costs and cost effectiveness. Tob Control. 1997;6(3):207-12.	Ineligible patient population	A, B, C, D, E
Sharma R, Shewade HD, Gopalan B, Badrel RK, Rana JS. Earned print media in advancing tobacco control in Himachal Pradesh, India: A descriptive study. BMJ global health. 2017;2(2):e000208.	Ineligible patient population	A, B, C, D, E
Shearer J, Shanahan M. Cost effectiveness analysis of smoking cessation interventions. Aust N Z J Public Health. 2006;30(5):428-34.	Ineligible intervention	A, B, C, D, E
Simpson SA, Nonnemaker JM. New York tobacco control program cessation assistance: Costs, benefits, and effectiveness. IJERGQ. 2013;10(3):1037-47.	Ineligible intervention	A, B, C, D, E
Singh K, Chandrasekaran AM, Bhaumik S, Chattopadhyay K, Gamage AU, Silva PD, et al. Cost-effectiveness of interventions to control cardiovascular diseases and diabetes mellitus in South Asia: A systematic review. BMJ Open. 2018;8(4):e017809.	Ineligible patient population	A, B, C, D, E

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Smit ES, Evers SMAA, de Vries H, Hoving C. Cost-effectiveness and cost-utility of Internet-based computer tailoring for smoking cessation. J Med Internet Res. 2013;15(3):e57.	Ineligible intervention	A, B, C, D, E
Smith MW, An LC, Fu SS, Nelson DB, Joseph AM. Cost-effectiveness of an intensive telephone-based intervention for smoking cessation. J Telemed Telecare. 2011;17(8):437-40.	Ineligible intervention	A, B, C, D, E
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Smith SS, Keller PA, Kobinsky KH, Baker TB, Fraser DL, Bush T, et al. Enhancing tobacco quitline effectiveness: Identifying a superior pharmacotherapy adjuvant. Nicotine Tob Res 2013;15(3):718-28.	Ineligible patient population	A, B, C, D, E
Stanczyk NE, Smit ES, Schulz DN, de Vries H, Bolman C, Muris JW, et al. An economic evaluation of a video- and text-based computer-tailored intervention for smoking cessation: a cost-effectiveness and cost-utility analysis of a randomized controlled trial. PLoS ONE. 2014;9(10):e110117.	Ineligible intervention	A, B, C, D, E
Stephens T, Kaiserman MJ, McCall DJ, Sutherland-Brown C. School-based smoking prevention: Economic costs versus benefits. Chronic Dis Can. 2000;21(2):62-7.	Ineligible intervention	A, B, C, D, E
Stevens W, Thorogood M, Kayikki S. Cost-effectiveness of a community anti-smoking campaign targeted at a high risk group in London. Health Promot Int. 2002;17(1):43-50.	Ineligible intervention	A, B, C, D, E
Tengs TO, Osgood ND, Chen LL. The cost-effectiveness of intensive national school-based anti-tobacco education: Results from the tobacco policy model. Prev Med. 2001;33:558-70.	Ineligible intervention	A, B, C, D, E
Tomson T, Helgason AR, Gilljam H. Quitline in smoking cessation: A cost-effectiveness analysis. Int J Technol Assess Health Care. 2004;20(4):469-74.	Ineligible intervention	A, B, C, D, E
US Community Preventive Services Task Force. Tobacco use and secondhand smoke exposure: Mass-reach health communication interventions. Force UCPST; 2013. Available from: https://www.thecommunityguide.org/findings/tobacco-use-and-secondhand-smoke-exposure-mass-reach-health-communication-interventions.	Ineligible study design	A, B, C, D, E
Van den Bruel A, Cleemput I, Van Linden A, Schoefs D, Ramaekers D, Bonneux L. Effectiveness and cost-effectiveness of treatments for smoking cessation. Belgian Health Care Knowledge C; 20 Aug 2005 2004. Available from: http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?ID=32005000669.	non-English language	A, B, C, D, E
Vemer P, Rutten-van Molken MP, Kaper J, Hoogenveen RT, van Schayck CP, Feenstra TL. If you try to stop smoking, should we pay for it? The cost utility of reimbursing smoking cessation support in the Netherlands. Addiction. 2010;105(6):1088-97.	Ineligible intervention	A, B, C, D, E
Vijgen SM, van Baal PH, Hoogenveen RT, de Wit GA, Feenstra TL. Cost-effectiveness analyses of health promotion programs: A	Ineligible intervention	A, B, C, D, E

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Villanti AC, Curry LE, Richardson A, Vallone DM, Holtgrave DR. Analysis of media campaign promoting smoking cessation suggests it was cost-effective in prompting quit attempts. Health Aff. 2012;31(12):2708-16.	Ineligible intervention	A, B, C, D, E
Vodopivec-Jamsek V, de Jongh T, Gurol-Urganci I, Atun R, Car J. Mobile phone messaging for preventive health care. Cochrane Database Syst Rev. 2012;12:CD007457.	Ineligible study design	A, B, C, D, E
Wang LY, Crossett LS, Lowry R, Sussman S, Dent CW. Cost-effectiveness of a school-based tobacco-use prevention program. Arch Pediatr Adolesc Med. 2001;155(9):1043-50.	Ineligible intervention	A, B, C, D, E
Warner KE, Jacobson PD, Kaufman NJ. Innovative approaches to youth tobacco control: introduction and overview. Tob Control. 2003;12 (Suppl 1):i1-15.	Ineligible study design	A, B, C, D, E
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White JS, Dow WH, Rungruanghiranya S. Commitment contracts and team incentives: A randomized controlled trial for smoking cessation in Thailand. Am J Prev Med. 2013;45(5):533-42.	Ineligible intervention	A, B, C, D, E
White VM, Warne CD, Spittal MJ, Durkin S, Purcell K, Wakefield MA. What impact have tobacco control policies, cigarette price and tobacco control programme funding had on Australian adolescents' smoking? Findings over a 15-year period. Addiction. 2011;106(8):1493-502.	Ineligible outcomes	A, B, C, D, E
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Wolfenden L, Nathan NK, Sutherland R, Yoong SL, Hodder RK, Wyse RJ, et al. Strategies for enhancing the implementation of school-based policies or practices targeting risk factors for chronic disease. Cochrane Database Syst Rev. 2017;11:CD011677.	Ineligible outcomes	A, B, C, D, E
Wong S, Ordean A, Kahan M, Gagnon R, Hudon L, Basso M, et al. Substance use in pregnancy. J Obstet Gynecol. 2011;33(4):367-84.	Ineligible intervention	A, B, C, D, E
Wu Q, Parrott S, Godfrey C, Gilbert H, Nazareth I, Leurent B, et al. Cost-effectiveness of computer-tailored smoking cessation advice in primary care: A randomized trial (ESCAPE). Nicotine Tob Res 2013;16(3):270-78.	Ineligible intervention	A, B, C, D, E

Reference	Reason for exclusion	RQs
Xu X, Alexander RJ, Simpson SA, Goates S, Nonnemaker JM, Davis KC, et al. A cost-effectiveness analysis of the first federally funded antismoking campaign. Am J Prev Med. 2014:epub.	Ineligible intervention	A, B, C, D, E
Yang W, Zou Q, Tan E, Watkins L, Beronja K, Hogan PF, et al. Future health and economic impact of comprehensive tobacco control in DoD: A microsimulation approach. Mil Med. 2018;183(1-2):e104-e12.	Ineligible patient population	A, B, C, D, E
Yousuf H, Reintjens R, Slipszenko E, Blok S, Somsen GA, Tulevski II, et al. Effectiveness of web-based personalised e-Coaching lifestyle interventions. Neth Heart J. 2019;27(1):24-29.	Ineligible outcomes	A, B, C, D, E

Appendix L – Research recommendations

No research recommendations have been made for reviews A or B.