

# Optimising tobacco control campaigns within a changing media landscape and among priority populations

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## ABSTRACT

Reviews published over the past decade confirm tobacco control campaigns can be effective for influencing adult and youth tobacco use behaviours, with strengthening evidence for high cost-effectiveness. Evidence is also accumulating for positive campaign effects on interpersonal discussions, social norms and policy support that can help motivate and sustain quitting and reduce uptake. Research needs over the next decade centre on the rapidly changing media environment and the equity of campaign effects among high smoking prevalence communities. The field needs specific evidence on: how to measure total campaign reach and frequency across the diverse range of media platforms and channels; the optimum mix of traditional, digital and social media to achieve behaviour change, especially among high smoking prevalence communities; the relative reach and impact of the wide variety of integrated, digital and social media message delivery methods; the relative effectiveness of messages that aim to build capacity to quit and optimum methods for combining motivational and capacity-building messages, especially for high prevalence groups who face additional barriers to staying quit; the ongoing effectiveness of traditional versus new versions of messages highlighting tobacco industry practices; the influence of e-cigarette use on tobacco control campaign effects; and the effectiveness of different types of campaigns aiming to prevent e-cigarette uptake and motivate e-cigarette cessation. Research is also needed to investigate the potential for campaigns to influence the public's understanding and support for endgame tobacco control policies and for campaign elements that may influence the social and environmental contexts surrounding smokers that support and maintain behaviour change.

Reviews published over the past decade confirm findings of previous reviews<sup>1–3</sup> that tobacco control campaigns, when used as part of a comprehensive tobacco control programme, can reduce youth smoking prevalence, initiation and progression to established smoking,<sup>4–6</sup> can increase adult quit attempts and smoking cessation, and can reduce smoking prevalence.<sup>6,7</sup> There is also good evidence tobacco control campaigns can be highly cost-effective.<sup>8–15</sup> Some reviews<sup>4,5</sup> have noted a need to update previous evidence given the rapidly changing media environment with more pervasive use of online and social media. Recent reviews also indicate not all campaigns are uniformly effective<sup>4,5,7,16</sup> and have mixed effects on reducing disparities in smoking prevalence.<sup>16,17</sup> They call for more research

into the impact of campaigns among high smoking prevalence communities that are often marginalised or disadvantaged (eg, lesbian, gay, bisexual, transgender (LGBT); Indigenous communities; some racial and ethnic groups; those experiencing mental health issues; and socioeconomically disadvantaged communities).<sup>5,16,18–21</sup>

The extent to which campaigns can change the smoking behaviour of a population depends on several factors, which can be broadly categorised into reach, impact and context (figure 1). Elements that affect campaign reach include the intensity, duration and regularity<sup>4,7</sup> of exposure to the campaign and media channels used to deliver messages.<sup>5</sup> Once the message has reached the audience, elements that may affect campaign impact include the message features,<sup>5</sup> needs and characteristics of the audience,<sup>18–20</sup> and again, media channels used. Once exposure has occurred and the audience has potentially been affected by the message, the degree to which exposure leads to behaviour change can be influenced by the social and environmental context.<sup>19,22</sup> Campaign activity can also affect broader antitobacco social norms and public support for tobacco control legislation. In turn, tobacco policy changes can influence the broader social and environmental context, and together with increased antitobacco social norms, can support individual cessation, reduce uptake and prevent relapse.<sup>22</sup>

This paper aims to provide guidance about specific research needs relevant to each of these factors, highlighting key recommendations from recent reviews and key studies published over the last decade.

## CAMPAIGN REACH

Reviews indicate that campaign intensity and duration can strongly influence campaign effectiveness.<sup>2,4,7,23,24</sup> Previous research suggested there may be a threshold of intensity needed to generate population-level behaviour change. This work, based on television ratings points data, indicated campaigns needed to achieve around four exposures per person in the target population per month,<sup>2</sup> or 8–12 exposures per person per quarter,<sup>25,26</sup> to observe changes in adult smoking behaviours.<sup>26</sup> The exposure for reducing youth smoking uptake was found to begin at a lower level, around three exposures per quarter, with greater effects at higher levels of exposure.<sup>2</sup> Other work has shown that effects on behaviour decay rapidly when campaigns are defunded,<sup>27,28</sup> suggesting sustained funding is needed to optimise campaign effects.



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**Figure 1** Antitobacco campaign factors that influence effectiveness and elements that affect these factors.

Over the past decade, there have been diminishing audiences for broadcast television and increasing audience time spent viewing digital and social media, playing video games and streaming programmes, podcasts and music. The use of these new media is especially prominent among the digital native generations but has also grown substantially among generation X and boomers, although for those aged 50+ years broadcast television remains dominant.<sup>29</sup> In response, campaign planners now rely more heavily on online platforms (eg, Facebook, Instagram, Twitter, YouTube, Snapchat and TikTok) and channels (eg, catch-up television, preroll videos shown before online news and entertainment videos) in addition to more traditional channels (ie, television, radio, billboards and print) to expose target audiences to messages. The dispersion of online platforms and channels demand varying video and static formats and results in more fragmented, as well as more targeted and personalised exposure to messages.<sup>30</sup> Research is needed to examine the optimum thresholds and channel/platform mix to achieve population-level behaviour change and explore whether reaching 75% of the target audience is still the benchmark for detectable impact<sup>26</sup> or whether this has changed in the current fragmented and more targeted media environment.<sup>31</sup>

Campaigns can also use a variety of strategies to enhance population message exposure,<sup>30</sup> including storyline integration,<sup>29 32 33</sup> sponsorship of 'must see' live television programmes like sport, delivery of messages targeted to postcodes via internet-connected televisions and via online and social media geotargeting, sponsoring 'news articles' linking to campaign webpages and messaging those who previously clicked on online campaign materials with additional messaging. Research is needed to examine how best to design and use these forms of campaign messaging.

New methods are urgently needed to measure the total reach of campaigns achieved across all platforms, channels and delivery methods. Currently, there are no objective methods for determining the proportion of a population exposed to a campaign's main video message/s across multiple channels, nor how many times each individual has been exposed.<sup>34</sup> Indeed, it

is difficult to objectively measure a single person's frequency of exposure within the digital sphere, and the decline of third-party cookies (see online supplemental file for definitions of online media tracking and metrics) will make this even more difficult.<sup>35</sup>

Given research showing objective measures of exposure via televised target audience rating points were typically strongly associated with self-reported campaign exposure,<sup>36 37</sup> one solution is to conduct studies to validate self-reported exposure to digital campaign messages against objective digital metrics (eg, impressions, video ads served and completed video views).<sup>34 38 39</sup> Other approaches include regular monitoring of population campaign recall under various media mix scenarios over time.<sup>31 40</sup>

Over recent years, the sharp rise in online content viewing and more expensive television airtime has driven an explosion in the use of shorter ads of 6 or 15 s, as well as ads that are 'skippable'. Research is needed to understand the effects on message reach and memorability of a greater proportion of a media buy being allocated towards shorter video messages. Research is also needed to understand the impact of 'skippability' on campaign reach and whether the lower cost is worthwhile. A recent study indicated the likelihood of youth recalling a YouTube anti-smoking message doubled with each *completed* ad view, but not with the number of ads *served*, with around three-quarters of the skippable videos served skipped.<sup>41</sup> Other priority questions include: are some people, including audiences campaigns most want to reach, more likely to skip than others?; which kinds of messages are more likely to be skipped?; and is the decision to skip influenced by the channel, platform or context in which the ad is placed?

Another challenge is unpacking the meaning of the exposure and engagement metrics available for the wide variety of digital and social media. We know relatively little about the extent to which impressions and click-throughs relate to meaningful exposure. The aim of some tobacco control campaign messages is to drive information-seeking or traffic to a website where further information, resources, app download links, cessation advice and assistance are available.<sup>38 40 42</sup> We need more information about

which platforms and channels are most likely to drive people to such websites and which are best at capturing the types of people who will engage with the website content. One recent study<sup>43</sup> indicated that the social media platform that had the best click-through rate had the least effective website engagement rate.

These issues of campaign reach and engagement are particularly pertinent when it comes to reducing disparities in tobacco use. Campaigns can *exacerbate* disparities when they have insufficient reach among priority groups, either because they are inadequately funded or delivered via channels that favour more socioeconomically advantaged groups.<sup>44–47</sup> Campaigns could instead potentially *enhance* equity if delivered via channels that have the greatest reach among those in priority groups. More studies are needed to determine whether higher levels of exposure can increase equity among disadvantaged populations, given some evidence that increasing the intensity of exposure of a general mass media campaign within these communities may increase quit attempts to higher than those from less disadvantaged communities.<sup>48–49</sup> There is also evidence that greater levels of exposure to youth antitobacco campaigns has been associated with more pronounced effects on lowering smoking rates among 10th and 12th graders from lower compared with higher socioeconomic backgrounds.<sup>41</sup> Given the tobacco industry's targeting of Indigenous, black, LGBT and other ethnic minority communities,<sup>50</sup> achieving antitobacco campaign reach that exceeds that of other lower prevalence communities is particularly important. Allen and colleagues<sup>5</sup> review urges that 'the media purchase should ensure exposure among racial/ethnic minority populations' and suggests it is important to '...supplement national media... through channels that reach a large proportion of at-risk minority individuals'.

### CAMPAIGN MESSAGE IMPACT

Campaign messages can have varied aims depending on the needs of the population, including messages that aim to increase knowledge, change attitudes and beliefs, reduce uptake, build motivation or the capacity to change, reduce relapse or influence the broader policy and social context.<sup>22–51</sup> Previous reviews and recent studies have provided strong evidence that antitobacco messages about the negative health effects of smoking using highly emotive imagery and stories are effective at motivating quit attempts and cessation help-seeking in adults.<sup>2–3 52–54</sup> These types of messages are also effective in generating positive interpersonal discussions,<sup>55–58</sup> influencing social norms<sup>59</sup> and policy support.<sup>60</sup> While most research has been conducted in high income countries, numerous studies in low-income and middle-income countries have also demonstrated the potential and actual impact of these types of campaigns.<sup>61–72</sup>

Previous reviews found more limited effectiveness of other types of messages among adults, including how-to-quit messages.<sup>2</sup> However, recent studies suggest that more positively framed messages that provide reasons to quit and ways to quit<sup>52–73</sup> and that encourage people to keep trying to quit<sup>74</sup> can be effective. Communications that increase confidence to quit and motivation to access cessation help could also contribute to quitting success,<sup>52–75</sup> especially given the protective effect that quitting self-efficacy has in the first 3 months after a quit attempt.<sup>76–77</sup> There is substantial room for further work exploring the potential of campaigns that aim to build hope, inspiration, self-efficacy and confidence,<sup>74–78</sup> potentially leveraging the evidence regarding tobacco pack inserts.<sup>79–83</sup> Research should explore whether campaigns can better motivate and sustain quit attempts by pairing or rotating strong

negative health effects messages with messages that build self-efficacy.<sup>74–78 84</sup>

Research could also focus on which messages and message combinations are especially helpful for high prevalence subgroups. Socioeconomic and environmental factors contribute to more challenging living and working conditions and greater financial stress for those living in disadvantaged communities.<sup>85</sup> In such communities different dimensions of disadvantage (eg, socioeconomic, race/ethnicity and mental health) can cluster (ie, this is often termed intersectionality), and consequently, these communities tend to have higher rates of behavioural risk factors for disease, including higher tobacco use. Within this context, race and ethnicity should not be considered a cause of health disparities but as a '... socially constructed proxy for structural determinants such as degree of disadvantage, marginalization, colonization and the pervasive effects of racism...'.<sup>86</sup> Discrimination, racism and the social and environmental context may pose additional barriers to smoking cessation.<sup>87–89</sup> Reviews published over the past decade have emphasised the need for more research exploring how to change smoking behaviours among high prevalence subgroups and communities.<sup>16 17 19</sup> Lee and colleagues' review<sup>18</sup> called for research into the best strategies for messaging to LGBT populations, pointing out that some cessation determinants may be unique or more common among LGBT individuals. Mosdøl and colleagues' review<sup>19</sup> highlighted the need for studies of people in more disadvantaged contexts and ethnic minority populations with a different first language than the general population. Compared with smokers in lower prevalence communities, smokers in disadvantaged and high prevalence communities tend to be motivated and attempt to quit at the same rates as those in less disadvantaged communities, but their quit success rates are lower.<sup>76 89–93</sup> This suggests a need for research on targeted messages to build quitting confidence and skills, to address common barriers to seeking cessation help in these groups and to deal with the personal, social and environmental contexts that promote smoking.

Recent reviews<sup>5 17 19 21</sup> also emphasise that evaluation designs need to be funded, designed and powered to be capable of detecting effects in priority populations. Campaign evaluations must find ways to recruit large enough samples in smaller high prevalence populations to enable equity effects to be detected.<sup>19 91 94–96</sup> This may be achieved through collecting and comparing survey data and/or qualitative interview data, or objective data such as quitline calls, from people within campaign targeted and non-targeted communities matched on sociodemographic factors.<sup>19</sup> Campaign evaluations will likely benefit from involving communities and seeking their advice on potential evaluation designs, important contextual issues, recruitment options and appropriate incentives for participation.<sup>20 21</sup> Systems perspectives and realist evaluation approaches that recognise the interactions between the mass media intervention and existing systems and social structures are likely to be particularly useful.<sup>17</sup>

Antitobacco campaigns are now being delivered in a context in which smokers are also using, or can use, electronic nicotine delivery systems (ENDS). Important issues to explore are whether dual users (or those intending to quit smoking by using ENDS) respond differently to antitobacco messages and whether availability of ENDS changes responses to antitobacco messages by influencing risk perceptions.<sup>97</sup> Given the widespread uptake of ENDS among youth in some countries,<sup>98 99</sup> more research is needed to examine whether media campaigns about ENDS can prevent ENDS uptake among non-smokers, especially youth and young adults.<sup>100–103</sup> Similarly, we need studies examining the impact of different types of messages that aim to prevent

e-cigarette uptake<sup>104 105</sup> and that encourage and support those who wish to stop using ENDS, including addicted youth.<sup>104-106</sup> Finally, what lessons apply from effective tobacco control campaigns to campaigns aimed at preventing and reducing ENDS use?

Allen and colleagues<sup>5</sup> review of campaign effects among youth indicated the effectiveness of health consequences messages is mixed, although messages with a negative emotional tone tend to have a greater influence than messages with a positive or neutral tone. They concluded that industry manipulation themes may be effective in combination with health consequences messages. Youth culture has substantially changed since much of this evidence was gathered,<sup>5</sup> necessitating studies to examine the ongoing effectiveness of these and other types of messages about tobacco industry practices. For example, can messages about environmental harms of tobacco growing, processing and waste be used to discourage youth from smoking? Research should also examine the effectiveness of messages that focus on the way the tobacco industry manipulates their products to make the smoke easier to inhale, more addictive and to give the illusion of lower harm<sup>107-110</sup> and the effects of messages highlighting the links between the tobacco industry and e-cigarette manufacturers marketing their products to youth.<sup>102</sup> As detailed previously, we also need to test new ways of delivering messages to youth via their preferred entertainment media, such as embedding messages within online games.<sup>5 30</sup>

## CAMPAIGN CONTEXT

In addition to exerting impact on individual smokers and recent quitters, campaigns can prompt discussions between family and friends, influence social norms and be aired at the same time as the implementation of tobacco control policies that can change the environment, improving opportunities and reducing barriers to change. These factors may be important in enabling smokers to translate campaign-prompted attempts into sustained cessation.<sup>51</sup> However, the co-occurrence of these factors can make it difficult to isolate the effects of population-wide campaigns compared with other interventions. Due to this, many evaluations of major national campaigns (eg, Tips from Former Smokers campaign; The EX campaign; The Truth campaign; Australia's National Tobacco Campaign; Heartbeat Wales) and region-wide campaigns (eg, Massachusetts and Minnesota campaigns; North Karelia, Finland) have been excluded from Cochrane reviews.<sup>4 7</sup>

In contrast to individual-campaign focused research, recent reviews<sup>16 17</sup> suggest we '... require the kinds of 'messy' evidence produced by observational and ecological studies...' and that greater investment is needed in research designs that track how communities' social norms, antitobacco policy changes and related systems interact with tobacco control mass media intervention effects over time, especially to examine if inequities are being reduced in communities where various forms of disadvantage cluster.<sup>17 20 111 112</sup> An exciting avenue to explore is whether messages developed and delivered by those in the smoker's local community to complement mass-reach campaign messages are effective. For example, can messages from local news outlets and local health professionals that endorse the primary messages of the mass-reach campaign help build an 'all-around' sense of a more non-smoking or cessation-supportive community and potentially help counteract prosmoking social norms that can promote taking up tobacco use or be a barrier to staying quit, especially in high

prevalence communities. Studies could also examine if motivational campaigns are enhanced by concurrently creating and promoting local 'quit together' groups and other social media cessation advice and support groups.<sup>112 113</sup>

Research is also needed to explore the extent to which mass media campaigns influence an individual's social norms and contexts. By exposing tobacco users and their children, partners, friends and work colleagues, campaigns have been found to increase support and pressure from the individual's close social network<sup>22</sup> and to generate social norm changes that can motivate smokers to quit and help them to stay quit.<sup>59 114</sup> More research is needed to examine which types of campaigns and in which contexts such social norm changes<sup>59</sup> and campaign-prompted discussions<sup>56</sup> are most likely to occur. Given much consumption of digital media is solo and messages delivered via these channels are often targeted to the person who smokes, there may be fewer non-smoking family and friends concurrently exposed. It would be helpful to explore the frequency of campaign-prompted online versus face-to-face discussions between smokers and non-smokers and to examine whether online discussions have similar benefits as face-to-face conversations.<sup>115 116</sup> Studies should also examine if there are positive effects of social media campaign message 'likes', 'shares' and 'comments' and identify the message characteristics most likely to promote such engagement.<sup>117</sup>

Relatively few studies have tested the theory that by exposing large segments of the population, including those who are part of the target audience and those who are not, mass media campaigns also increase broader public understanding and support for policy changes and that these policy changes can provide an environment that helps tobacco users change their behaviour and avoid relapse.<sup>22</sup> One study found that large scale antitobacco campaigns increased support for indoor smoking bans,<sup>60</sup> while an experimental study indicated that messages that induced fear were associated with higher support for tobacco control policies among non-smokers but not smokers.<sup>118</sup> Campaigns have also been found to complement or magnify the effects of policy changes, with studies in Australia and Mexico demonstrating the effectiveness of new graphic health warnings was increased among smokers who were also exposed to complementary mass media campaigns, and similarly, that campaign effectiveness was enhanced by concurrent exposure to graphic health warnings.<sup>70 119</sup> Studies could usefully examine whether campaigns can capitalise on increased motivation to quit when prices/taxes are increased or certain product attributes are banned, for example, by providing links for motivated smokers to directly access cessation services, products and information.

As jurisdictions increasingly regulate the product (eg, menthol bans and flavour capsule bans), another important potential role for campaigns is to explain the rationale for these regulations in a way that both increases support for the change and encourages smokers to use the change as an opportunity to quit. For example, educating smokers about how menthol can increase nicotine dependence may not only increase support for a menthol ban but may mean smokers view its implementation as a compelling reason and opportunity to quit.

Campaigns are also likely to play a critical role as jurisdictions move towards various forms of endgame strategies,<sup>120 121</sup> including explaining why an endgame for the industry is justified and in helping support high prevalence communities to move towards this goal. Research should guide the development of such messaging, for example, by studying whether there is value in highlighting the perverse situation where the tobacco industry gets a free pass to sell an unsafe product that other industries do not get.<sup>121</sup> Research is also needed to guide communication of

the rationale for and evidence in support of specific endgame policies to the public and to stakeholder groups (eg, smokers and tobacco retailers). There will also be a need for research to guide messaging to effectively counter the likely misinformation from the tobacco industry about endgame policies.

## CONCLUSION

In addition to directly influencing individual smokers, campaigns can prompt interpersonal discussions, change social norms and promote the implementation of tobacco control policies that can change the environment, thereby increasing opportunities to quit and reducing barriers to change. A decade ago, the dominance of traditional media channels typically meant that a large segment of the population could be reached by broadcasting a 30 s video message on television.<sup>122 123</sup> With the growing popularity of digital and social media, campaigns must now deliver messages in more targeted ways across many different platforms and channels. This has resulted in a proliferation of newer message formats, including shorter video messages and multiple static images for digital and social media, and has provided more opportunities for online interaction with cessation services. These changes have implications for campaign reach and impact that need to be explored. Future research is also needed to examine the best ways of embedding messages in must-see ‘live’ programmes, streaming programmes and gaming storylines. In addition, much of the evidence about mass media campaigns comes from high-income countries and from campaigns intended to reach a broad cross-section of the smoker population.<sup>24 57</sup> Hill and colleagues’ review<sup>16</sup> underscored the need for more research exploring how to improve the equity of campaign effects on low socioeconomic status and racial and ethnically diverse groups, while other reviews have focused on research needs for other groups who typically have high levels of smoking prevalence, such as LGBT<sup>18</sup> and Indigenous communities.<sup>20</sup>

The convergence of these media changes and an increased focus on the importance of achieving equity mean that the research needs for tobacco control campaigns over the next decade will centre on examining how we can best reach and exert impact in our continually evolving media environment, especially among high prevalence populations. This will likely require campaign developers and evaluators to attend to the campaign’s influence on individual level behaviour change and to the influence of online and in-person social and environmental factors that surround the smoker and that can be leveraged to support and maintain behaviour change.

### What this paper adds

- ▶ This paper outlines the tobacco control campaign research needs for the next decade, with a focus on factors that influence campaign reach, impact and context.
- ▶ Needs centre on the rapidly changing media environment and the equity of campaign effects among high smoking prevalence communities.
- ▶ Research is also needed to examine the potential for campaigns to influence the policy and sociocultural environment surrounding smokers.

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## REFERENCES

- 1 US Department of Health and Human Services. *Preventing tobacco use among youth and young adults: a report of the surgeon General. Report*. Atlanta, Georgia, Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, 2012.
- 2 Durkin S, Brennan E, Wakefield M. Mass media campaigns to promote smoking cessation among adults: an integrative review. *Tob Control* 2012;21:127–38.
- 3 National Cancer Institute. *The role of the media in promoting and reducing tobacco use*. Institute NC, eds. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, 2008.
- 4 Carson KV, Ameer F, Sayehmiri K, et al. Mass media interventions for preventing smoking in young people. *Cochrane Database Syst Rev* 2017;6:CD001006.
- 5 Allen JA, Duke JC, Davis KC, et al. Using mass media campaigns to reduce youth tobacco use: a review. *Am J Health Promot* 2015;30:e71–82.
- 6 Wilson LM, Avila Tang E, Chander G, et al. Impact of tobacco control interventions on smoking initiation, cessation, and prevalence: a systematic review. *J Environ Public Health* 2012;2012:961724
- 7 Bala MM, Strzeszynski L, Topor-Madry R. Mass media interventions for smoking cessation in adults. *Cochrane Database Syst Rev* 2017;11:CD004704.
- 8 Xu X, Alexander RL, Simpson SA, et al. A cost-effectiveness analysis of the first federally funded antismoking campaign. *Am J Prev Med* 2015;48:318–25.
- 9 Atusingwize E, Lewis S, Langley T. Economic evaluations of tobacco control mass media campaigns: a systematic review. *Tob Control* 2015;24:320–7.
- 10 Shrestha SS, Davis K, Mann N. Cost effectiveness of the tips from former smokers Campaign-U.S 2012-2018. *Am J Prev Med* 2020.
- 11 Hurley SF, Matthews JP. Cost-effectiveness of the Australian National tobacco campaign. *Tob Control* 2008;17:379.
- 12 Leão T, Kunst AE, Perelman J. Cost-effectiveness of tobacco control policies and programmes targeting adolescents: a systematic review. *Eur J Public Health* 2018;28:39–43.
- 13 Holtgrave DR, Wunderink KA, Vallone DM, et al. Cost-utility analysis of the National truth campaign to prevent youth smoking. *Am J Prev Med* 2009;36:385–8.
- 14 Secker-Walker RH, Worden JK, Holland RR, et al. A mass media programme to prevent smoking among adolescents: costs and cost effectiveness. *Tob Control* 1997;6:207–12.
- 15 Fishman PA, Ebel BE, Garrison MM, et al. Cigarette tax increase and media campaign cost of reducing smoking-related deaths. *Am J Prev Med* 2005;29:19–26.
- 16 Hill S, Amos A, Clifford D, et al. Impact of tobacco control interventions on socioeconomic inequalities in smoking: review of the evidence. *Tob Control* 2014;23:e89–97.
- 17 Smith CE, Hill SE, Amos A. Impact of population tobacco control interventions on socioeconomic inequalities in smoking: a systematic review and appraisal of future research directions. *Tob Control* 2021;30:e87–95.
- 18 Lee JGL, Matthews AK, McCullen CA, et al. Promotion of tobacco use cessation for lesbian, gay, bisexual, and transgender people: a systematic review. *Am J Prev Med* 2014;47:823–31.
- 19 Mosdøl A, Lidal IB, Straumann GH. Targeted mass media interventions promoting healthy behaviours to reduce risk of non-communicable diseases in adult, ethnic minorities. *Cochrane Database Sys Review* 2017;2.
- 20 Chamberlain C, Perlen S, Brennan S, et al. Evidence for a comprehensive approach to Aboriginal tobacco control to maintain the decline in smoking: an overview of reviews among Indigenous peoples. *Syst Rev* 2017;6:135.
- 21 Guillaumier A, Bonevski B, Paul C. Anti-tobacco mass media and socially disadvantaged groups: a systematic and methodological review. *Drug Alcohol Rev* 2012;31:698–708.
- 22 Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behaviour. *Lancet* 2010;376:1261–71.
- 23 Robinson MN, Tansil KA, Elder RW, et al. Mass media health communication campaigns combined with health-related product distribution: a community guide systematic review. *Am J Prev Med* 2014;47:360–71.
- 24 Kuipers MAG, Beard E, West R, et al. Associations between tobacco control mass media campaign expenditure and smoking prevalence and quitting in England: a time series analysis. *Tob Control* 2018;27:455.
- 25 Davis KC, Patel D, Shafer P, et al. Association between media doses of the tips from former smokers campaign and cessation behaviors and intentions to quit among cigarette smokers, 2012-2015. *Health Educ Behav* 2018;45:52–60.

- 26 Centers for Disease Control Prevention. *Best Practices for Comprehensive Tobacco Control Programs - 2014*. Atlanta, USA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- 27 Dono J, Bowden J, Kim S, *et al*. Taking the pressure off the spring: the case of rebounding smoking rates when antitobacco campaigns ceased. *Tob Control* 2019;28:233.
- 28 Niederdeppe J, Farrelly MC, Hersey JC, *et al*. Consequences of dramatic reductions in state tobacco control funds: Florida, 1998-2000. *Tob Control* 2008;17:205-10.
- 29 Nielsen-USA. The Nielsen total Audience report. Nielsen Holdings, 2021. Available: <https://www.nielsen.com/us/en/insights/report/2021/total-audience-advertising-across-todays-media/>
- 30 Westcott K, Arbanas J, Downs K. Digital media trends, 15th ed. Courting the consumer in a world of choice., 2021. Available: <https://www2.deloitte.com/us/en/insights/industry/technology/digital-media-trends-consumption-habits-survey/summary.html>
- 31 Hair EC, Niederdeppe J, Rath JM, *et al*. Using aggregate temporal variation in Ad awareness to assess the effects of the truth® campaign on youth and young adult smoking behavior. *J Health Commun* 2020;25:223-31.
- 32 Slater MD. Entertainment education and the persuasive impact of narratives. In: Green MC, Strange JJ, Brock TC, eds. *Narrative impact: social and cognitive foundations*. Mahwah, NJ: Lawrence Erlbaum, 2002: 157-81.
- 33 Shen F, Han Jiangxue (Ashley), Han J. Effectiveness of entertainment education in communicating health information: a systematic review. *Asian J Commun* 2014;24:605-16.
- 34 Romberg AR, Bennett M, Tulsiani S, *et al*. Validating self-reported AD recall as a measure of exposure to digital advertising: an exploratory analysis using AD tracking methodology. *Int J Environ Res Public Health* 2020;17. doi:10.3390/ijerph17072185. [Epub ahead of print: 25 Mar 2020].
- 35 Nielsen-USA. Understanding the importance of people-based data in a cookieless world, 2021. Available: <https://www.nielsen.com/us/en/insights/video/2021/understanding-the-importance-of-people-based-data-in-a-cookieless-world/>
- 36 Niederdeppe J. Assessing the validity of confirmed Ad recall measures for public health communication campaign evaluation. *J Health Commun* 2005;10:635-50.
- 37 Dunlop SM, Perez D, Cotter T. The natural history of antismoking advertising recall: the influence of broadcasting parameters, emotional intensity and executional features. *Tob Control* 2014;23:215-22.
- 38 Kim A, Hansen H, Duke J, *et al*. Does digital ad exposure influence information-seeking behavior online? Evidence from the 2012 tips from former smokers national tobacco prevention campaign. *J Med Internet Res* 2016;18:e64.
- 39 Davis KC, Shafer PR, Rodes R, *et al*. Does digital video advertising increase population-level reach of multimedia campaigns? Evidence from the 2013 tips from former smokers campaign. *J Med Internet Res* 2016;18:e235.
- 40 Chan L, O'Hara B, Phongsavan P, *et al*. Review of evaluation metrics used in digital and traditional tobacco control campaigns. *J Med Internet Res* 2020;22:e17432.
- 41 Colston DC, Xie Y, Thrasher JF, *et al*. Examining truth and State-Sponsored media campaigns as a means of decreasing youth smoking and related disparities in the U.S. *Nicotine Tob Res* 2021. doi:10.1093/ntr/ntab226. [Epub ahead of print: 29 Oct 2021].
- 42 Baskerville NB, Azagba S, Norman C, *et al*. Effect of a digital social media campaign on young adult smoking cessation. *Nicotine Tob Res* 2016;18:351-60.
- 43 Reuter K, Wilson ML, Moran M, *et al*. General Audience engagement with antismoking public health messages across multiple social media sites: comparative analysis. *JMIR Public Health Surveill* 2021;7:e24429.
- 44 Niederdeppe J, Fiore MC, Baker TB, *et al*. Smoking-cessation media campaigns and their effectiveness among socioeconomically advantaged and disadvantaged populations. *Am J Public Health* 2008;98:916-24.
- 45 Niederdeppe J, Kuang X, Crock B, *et al*. Media campaigns to promote smoking cessation among socioeconomically disadvantaged populations: what do we know, what do we need to learn, and what should we do now? *Soc Sci Med* 2008;67:1343-55.
- 46 Blake KD, Willis G, Kaufman A. Population prevalence and predictors of self-reported exposure to court-ordered, tobacco-related corrective statements. *Tob Control* 2020;29:516.
- 47 Vallone DM, Ilakkuvan V, Xiao H, *et al*. Contextual influences and campaign awareness among young adults: evidence from the National truth® campaign. *Behav Med* 2015;41:155-63.
- 48 McAfee T, Davis KC, Shafer P, *et al*. Increasing the dose of television advertising in a national antismoking media campaign: results from a randomised field trial. *Tob Control* 2017;26:19-28.
- 49 Duke JC, Vallone DM, Allen JA, *et al*. Increasing youths' exposure to a tobacco prevention media campaign in rural and low-population-density communities. *Am J Public Health* 2009;99:2210-6.
- 50 Public-Health-Law-Center. The tobacco industry and the black community, 2021
- 51 Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;6:42.
- 52 Sims M, Langley T, Lewis S, *et al*. Effectiveness of tobacco control television advertisements with different types of emotional content on tobacco use in England, 2004-2010. *Tob Control* 2016;25:21-6.
- 53 Murphy-Hoefler R, Davis KC, Beistle D, *et al*. Impact of the tips from former smokers campaign on population-level smoking cessation, 2012-2015. *Prev Chronic Dis* 2018;15:E71.
- 54 Guignard R, Gallopel-Morvan K, Mons U, *et al*. Impact of a negative emotional antitobacco mass media campaign on French smokers: a longitudinal study. *Tob Control* 2018;27:670.
- 55 Dunlop SM, Wakefield M, Kashima Y. The contribution of antismoking advertising to quitting: intra- and interpersonal processes. *J Health Commun* 2008;13:250-66.
- 56 Dunlop SM, Kashima Y, Wakefield M. Predictors and consequences of conversations about health promoting media messages. *Commun Monogr* 2010;77:518-39.
- 57 Brennan E, Durkin SJ, Wakefield M, *et al*. Why do smokers talk about antismoking campaigns? predictors of the occurrence and content of campaign-generated conversations. *Health Commun* 2017;32:1539-56.
- 58 Brennan E, Durkin SJ, Wakefield MA, *et al*. Talking about antismoking campaigns: what do smokers talk about, and how does talk influence campaign effectiveness? *J Health Commun* 2016;21:33-45.
- 59 Durkin SJ, Schoenaker D, Brennan E, *et al*. Are anti-smoking social norms associated with tobacco control mass media campaigns, Tax and policy changes? findings from an Australian serial cross-sectional population study of smokers. *Tob Control* 2021;30:177-84.
- 60 Niederdeppe J, Kellogg M, Skurka C, *et al*. Market-level exposure to state antismoking media campaigns and public support for tobacco control policy in the United States, 2001-2002. *Tob Control* 2018;27:177.
- 61 Wakefield M, Bayly M, Durkin S, *et al*. Smokers' responses to television advertisements about the serious harms of tobacco use: pre-testing results from 10 low- to middle-income countries. *Tob Control* 2013;22:24-31.
- 62 Durkin S, Bayly M, Cotter T, *et al*. Potential effectiveness of anti-smoking advertisement types in ten low and middle income countries: do demographics, smoking characteristics and cultural differences matter? *Soc Sci Med* 2013;98:204-23.
- 63 Perl R, Stebenkova L, Morozova I, *et al*. Mass media campaigns within reach: effective efforts with limited resources in Russia's capital city. *Tob Control* 2011;20:439.
- 64 Murukutla N, Bayly M, Mullin S, *et al*. Male smoker and non-smoker responses to television advertisements on the harms of secondhand smoke in China, India and Russia. *Health Educ Res* 2015;30:24-34.
- 65 Perl R, Murukutla N, Ocleston J, *et al*. Responses to antismoking radio and television advertisements among adult smokers and non-smokers across Africa: message-testing results from Senegal, Nigeria and Kenya. *Tob Control* 2015;24:601-8.
- 66 Hamill S, Turk T, Murukutla N, *et al*. 'I like' MPOWER: using Facebook, online ads and new media to mobilise tobacco control communities in low-income and middle-income countries. *Tob Control* 2015;24:306-12.
- 67 Huang L-L, Friedman DB, Lin F-C, *et al*. Which types of anti-smoking television advertisements work better in Taiwan? *Health Promot Int* 2016;30:daw085.
- 68 Huang L-L, Thrasher JF, Jiang Y, *et al*. Impact of the 'Giving Cigarettes is Giving Harm' campaign on knowledge and attitudes of Chinese smokers. *Tob Control* 2015;24 Suppl 4:iv28.
- 69 Vital-Strategies. Tobacco control, 2021. Available: <https://www.vitalstrategies.org/programs/tobacco-control/>
- 70 Thrasher JF, Huang L, Pérez-Hernández R, *et al*. Evaluation of a social marketing campaign to support Mexico City's comprehensive smoke-free law. *Am J Public Health* 2011;101:328-35.
- 71 Thrasher JF, Murukutla N, Pérez-Hernández R, *et al*. Linking mass media campaigns to pictorial warning labels on cigarette packages: a cross-sectional study to evaluate effects among Mexican smokers. *Tob Control* 2013;22:e57.
- 72 Chang F-C, Chung C-H, Chuang Y-C, *et al*. Effect of media campaigns and smoke-free ordinance on public awareness and secondhand smoke exposure in Taiwan. *J Health Commun* 2011;16:343-58.
- 73 Vallone DM, Duke JC, Cullen J, *et al*. Evaluation of ex: a national mass media smoking cessation campaign. *Am J Public Health* 2011;101:302-9.
- 74 Durkin S, Bayly M, Brennan E, *et al*. Fear, sadness and hope: which emotions maximize impact of anti-tobacco mass media advertisements among lower and higher Ses groups? *J Health Commun* 2018;23:445-61.
- 75 Nonnenmaker J, Hersey J, Homsí G, *et al*. Self-reported exposure to policy and environmental influences on smoking cessation and relapse: a 2-year longitudinal population-based study. *Int J Environ Res Public Health* 2011;8:3591-608.
- 76 Thomas DP, Lyons L, Borland R. Predictors and reasons for starting and sustaining quit attempts in a national cohort of Aboriginal and Torres Strait Islander smokers. *Drug Alcohol Rev* 2019;38:244-53.
- 77 Yong H-H, Borland R, Cummings KM, *et al*. Do predictors of smoking relapse change as a function of duration of abstinence? findings from the United States, Canada, United Kingdom and Australia. *Addiction* 2018;113:1295-304.

- 78 Rath JM, Green MP, Vallone DM, *et al.* The role of emotions and perceived AD effectiveness: evidence from the truth FinishIt campaign. *Am J Health Promot* 2019;33:1152–8.
- 79 Thrasher JF, Anshari D, Lambert-Jessup V, *et al.* Assessing smoking cessation messages with a discrete choice experiment. *Tob Regul Sci* 2018;4:73–87.
- 80 Thrasher JF, Islam F, Davis RE, *et al.* Testing cessation messages for cigarette package inserts: findings from a best/worst discrete choice experiment. *Int J Environ Res Public Health* 2018;15. doi:10.3390/ijerph15020282. [Epub ahead of print: 06 Feb 2018].
- 81 Thrasher JF, Swayampakala K, Cummings KM, *et al.* Cigarette package inserts can promote efficacy beliefs and sustained smoking cessation attempts: a longitudinal assessment of an innovative policy in Canada. *Prev Med* 2016;88:59–65.
- 82 Moodie C. Adult smokers' perceptions of cigarette pack inserts promoting cessation: a focus group study. *Tob Control* 2018;27:72–7.
- 83 Blank M-L, Hoek J, Gendall P. Roll-your-own smokers' reactions to cessation-efficacy messaging integrated into tobacco packaging design: a sequential mixed-methods study. *Tob Control* 2020:tobaccocontrol-2019-055570.
- 84 Nabi RL. Emotional flow in persuasive health messages. *Health Commun* 2015;30:114–24.
- 85 Dahlgren G, Whitehead M. *Policies and strategies to promote social equity in health. background document to WHO-Strategy paper for Europe.* Institute for Futures Studies, 1991.
- 86 Pearson JL, Waa A, Siddiqi K, *et al.* Naming racism, not race, as a determinant of tobacco-related health disparities. *Nicotine Tob Res* 2021;23:885–7.
- 87 Titus AR, Gamarel KE, Thrasher JF, *et al.* Are sexual minority adults differentially exposed to smoke-free laws and televised anti-tobacco media campaigns compared to the general US population? A descriptive analysis. *Tob Control* 2020:tobaccocontrol-2020-055893..
- 88 Ashton M, Rigby A, Galletly C. Do population-wide tobacco control approaches help smokers with mental illness? *Aust N Z J Psychiatry* 2014;48:121–3.
- 89 Greenhalgh E, Bayly M, Brennan E, *et al.* The great socioeconomic smoking divide: is the gap widening in Australia, and why? *Tob Prev Cessat* 2018;4:A116.
- 90 Nicholson AK, Borland R, Davey ME, *et al.* Past quit attempts in a national sample of Aboriginal and Torres Strait Islander smokers. *Med J Aust* 2015;202:S20–5.
- 91 Prochaska JJ, Gates EF, Davis KC, *et al.* The 2016 tips from former Smokers@ campaign: associations with quit intentions and quit attempts among smokers with and without mental health conditions. *Nicotine Tob Res* 2019;21:576–83.
- 92 Greenhalgh EM, Brennan E, Segan C, *et al.* Monitoring changes in smoking and quitting behaviours among Australians with and without mental illness over 15 years. *Aust N Z J Public Health* 2021. doi:10.1111/1753-6405.13185. [Epub ahead of print: 25 Nov 2021].
- 93 Vangeli E, Stapleton J, Smit ES, *et al.* Predictors of attempts to stop smoking and their success in adult general population samples: a systematic review. *Addiction* 2011;106:2110–21.
- 94 Grigg M, Waa A, Bradbrook SK. Response to an indigenous smoking cessation media campaign - it's about whānau. *Aust N Z J Public Health* 2008;32:559–64.
- 95 Guillory J, Crankshaw E, Farrelly MC, *et al.* LGBT young adults' awareness of and receptivity to the *This Free Life* tobacco public education campaign. *Tob Control* 2021;30:63.
- 96 Gould GS, McEwen A, Watters T, *et al.* Should anti-tobacco media messages be culturally targeted for Indigenous populations? A systematic review and narrative synthesis. *Tob Control* 2013;22:e7.
- 97 Tattan-Birch H, Jackson SE, Ide C, *et al.* Evaluation of the impact of a regional educational advertising campaign on harm perceptions of e-cigarettes, prevalence of e-cigarette use, and quit attempts among smokers. *Nicotine Tob Res* 2020;22:1148–54.
- 98 Cullen KA, Ambrose BK, Gentzke AS, *et al.* Notes from the Field: Use of Electronic Cigarettes and Any Tobacco Product Among Middle and High School Students - United States, 2011–2018. *MMWR Morb Mortal Wkly Rep* 2018;67:1276–7.
- 99 Cullen KA, Gentzke AS, Sawdey MD, *et al.* E-Cigarette use among youth in the United States, 2019. *JAMA* 2019;322:2095–103.
- 100 Noar SM, Rohde JA, Prentice-Dunn H, *et al.* Evaluating the actual and perceived effectiveness of e-cigarette prevention advertisements among adolescents. *Addict Behav* 2020;109:106473.
- 101 Rohde JA, Noar SM, Prentice-Dunn H, *et al.* Comparison of Message and Effects Perceptions for *The Real Cost* E-Cigarette Prevention Ads. *Health Commun* 2021;36:1222–30.
- 102 England KJ, Edwards AL, Paulson AC, *et al.* Rethink Vape: development and evaluation of a risk communication campaign to prevent youth e-cigarette use. *Addict Behav* 2021;113:106664.
- 103 Centers-for-Disease-Control-and-Prevention. Protecting Young People from E-cigarettes 2021 [Digital Display, Out-of-Home, Print, Radio, Social Media Materials, Supporting Material]. Available: <https://nccd.cdc.gov/MCRC/apps/ExploreCampaignDetails.aspx?CampaignID=248>
- 104 Noar SM, Rohde JA, Horvitz C, *et al.* Adolescents' receptivity to e-cigarette harms messages delivered using text messaging. *Addict Behav* 2019;91:10.1016/j.addbeh.2018.05.025:201–7.
- 105 King JL, Lazard A, Reboussin BA, *et al.* Optimizing warnings on e-cigarette advertisements. *Nicotine Tob Res* 2020;22:630–7.
- 106 Truth-Orange. Quitting Vaping, 2021. Available: <https://www.youtube.com/playlist?list=PLDVVQDN6OECkyX5IYgu8nMzJsLHZgqiEV> [Accessed 25 Jun 2021].
- 107 Song M-A, Benowitz NL, Berman M, *et al.* Cigarette filter ventilation and its relationship to increasing rates of lung adenocarcinoma. *J Natl Cancer Inst* 2017;109:djx075.
- 108 World Health Organisation (WHO). *Advisory note: banning menthol in tobacco products.* Geneva, Switzerland, 2016.
- 109 World Health Organisation (WHO). *Advisory note: banning menthol in tobacco products.* Geneva, Switzerland, 2018.
- 110 King B, Borland R, Le Grande M, *et al.* Smokers' awareness of filter ventilation, and how they believe it affects them: findings from the ITC four country survey. *Tob Control* 2021. doi:10.1136/tobaccocontrol-2020-056134. [Epub ahead of print: 15 Jun 2021].
- 111 Khan A, Green K, Khandaker G. How can a coordinated regional smoking cessation initiative be developed and implemented? A programme logic model to evaluate the '10,000 Lives' health promotion initiative in Central Queensland, Australia. *BMJ Open* 2020;11.
- 112 Jackson SE, Beard E, West R, *et al.* Evaluation of the London smoking cessation transformation programme: a time-series analysis. *Addiction* 2021;116:10.1111/add.15367:1558–68.
- 113 Kuipers MAG, West R, Beard EV, *et al.* Impact of the "Stoptober" Smoking Cessation Campaign in England From 2012 to 2017: A Quasiexperimental Repeat Cross-Sectional Study. *Nicotine Tob Res* 2020;22:1453–9.
- 114 Schoemaker DAJM, Brennan E, Wakefield MA, *et al.* Anti-smoking social norms are associated with increased cessation behaviours among lower and higher socioeconomic status smokers: a population-based cohort study. *PLoS One* 2018;13:e0208950.
- 115 van den Putte B, Yzer M, Southwell BG, *et al.* Interpersonal communication as an indirect pathway for the effect of antismoking media content on smoking cessation. *J Health Commun* 2011;16:470–85.
- 116 Jeong M, Tan ASL, Brennan E, *et al.* Talking about quitting: interpersonal communication as a mediator of campaign effects on smokers' quit behaviors. *J Health Commun* 2015;20:1196–205.
- 117 Strelakova YA, Damiani RE. Message design and Audience engagement with tobacco prevention posts on social media. *J Cancer Educ* 2018;33:668–72.
- 118 Halkjelsvik T. Do disgusting and fearful anti-smoking advertisements increase or decrease support for tobacco control policies? *Int J Drug Policy* 2014;25:10.1016/j.drugpo.2014.01.021:744–7.
- 119 Brennan E, Durkin SJ, Cotter T, Wakefield M, *et al.* Mass media campaigns designed to support new pictorial health warnings on cigarette packets: evidence of a complementary relationship. *Tob Control* 2011;20:412–8.
- 120 Daube M, Maddox R. Impossible until implemented: New Zealand shows the way. *Tob Control* 2021;30:361–2.
- 121 McDaniel PA, Smith EA, Malone RE. The tobacco endgame: a qualitative review and synthesis. *Tob Control* 2016;25:594–604.
- 122 Dunlop S, Cotter T, Perez D, *et al.* Televised antismoking advertising: effects of level and duration of exposure. *Am J Public Health* 2013;103:e66–73.
- 123 Biener L, Wakefield M, Shiner CM, *et al.* How broadcast volume and emotional content affect youth recall of anti-tobacco advertising. *Am J Prev Med* 2008;35:14–19.