Original Investigation

Does Tobacco-Control Mass Media Campaign Exposure Prevent Relapse Among Recent Quitters?

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Abstract

Objective: To determine whether greater mass media campaign exposure may assist recent quitters to avoid relapse.

Method: Using date of data collection and postcode, media market estimates of televised tobacco-control advertising exposure measured by gross ratings points (GRPs) were merged with a replenished cohort study of 443 Australians who had quit in the past year. Participants' demographic and smoking characteristics prior to quitting, and advertising exposure in the period after quitting, were used to predict relapse 1 year later.

Results: In multivariate analysis, each increase in exposure of 100 GRPs (i.e., 1 anti-smoking advertisement) in the three-month period after the baseline quit was associated with a 5% increase in the odds of not smoking at follow-up (OR = 1.05, 95% CI 1.02–1.07, $p < 0.001$). This relationship was linear and unmodified by length of time quit prior to the baseline interview. At the mean value of 1081 GRPs in the 3 months after the baseline-quit interview, the predicted probability of being quit at follow-up was 52%, whereas it was 41% for the minimum (0) and 74% for the maximum (3,541) GRPs.

Conclusion: Greater exposure to tobacco-control mass media campaigns may reduce the likelihood of relapse among recent quitters.

Introduction

Reviews of published literature conclude that exposure to tobacco-control mass media campaigns, when conducted as part of comprehensive tobacco-control programs, reduce adult smoking behavior

(Bala, Strzeszynski, & Cahill, 2008; Durkin, Brennan, & Wakefield, 2012; National Cancer Institute, 2008). Recent population-based empirical studies have demonstrated beneficial effects of greater campaign exposure on outcomes such as increasing the likelihood of quit attempts (Emery et al., 2012; Vallone, Duke, Cullen, McCausland, & Allen, 2011; Wakefield, Spittal, Yong, Durkin, & Borland, 2011), improving rates of smoking cessation (Durkin, Biener, & Wakefield, 2009; Terry-McElrath et al., 2011), and reducing adult smoking prevalence (Emery et al., 2012; Wakefield et al., 2008) and consumption (Emery et al., 2012).

Despite relapse being extremely common (Borland, Partos, Yong, Cummings, & Hyland, 2012; Hughes, Keely, & Naud, 2004; Marlatt, Curry, & Gordon, 1988; Piasecki, Fiore, McCarthy, & Baker, 2002), few studies have specifically examined the possibility that mass media campaigns might prevent relapse among those who have already quit. Studies find that some of the factors that promote relapse occur in a time-dependent manner, whereas others have a more pervasive influence (Herd & Borland, 2009; Herd, Borland, & Hyland, 2009; Yong, Borland, Cooper, & Cummings, 2010). In a cohort study, Herd et al. (2009) found high self-efficacy (or confidence) for quitting to protect against relapse, irrespective of length of time quit. Strong urges to smoke precipitated later relapse, but not early relapse, perhaps because people expect such urges soon after quitting and are more vigilant. The perceived benefits of smoking and perceived barriers to quitting were associated with increased probability of relapse only to the extent that they led to more urges to smoke and/or reduced self-efficacy for staying quit (Herd & Borland, 2009). Messages aimed at reducing the perceived benefits of smoking (and increasing the perceived costs of smoking) and increasing self-efficacy for quitting are often used in media campaigns to encourage quitting and may be especially helpful for those who have quit during periods of high relapse vulnerability, which

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is typically soon after quitting (Hughes, Keely, & Naud, 2004). Many campaigns serve to powerfully illustrate that tobacco use is harmful and/or increasingly socially unacceptable, and that quitting is desirable and possible. Such persuasive reminders could prompt those struggling with urges to smoke to continue to resist or more generally reinforce the value of quitting.

Cross-sectional surveys show that those who have recently quit smoking retrospectively attribute antismoking advertising campaigns to have exerted a beneficial influence on the maintenance of their smoking cessation (Biener et al., 2006; Wakefield, Freeman, & Donovan, 2003). However, no studies have prospectively tested whether the extent of mass media campaign exposure among those who are recently quit might prevent subsequent smoking and what the optimal timing for exposure might be. A recently published cohort study found no relationship between baseline recall of cessation advertising prior to the baseline interview and relapse back to smoking 1 year later (Nonnemaker et al., 2011). However that study did not measure advertising exposure between the baseline and the follow-up interviews, a period when advertising might be temporally more expected to prevent relapse. The aim of this article was to determine whether the timing and the intensity of exposure to tobacco-control mass media campaigns might prevent relapse among a cohort of smokers who had recently quit. We employed data from the Australian arm of the International Tobacco Control Four-Country Survey (ITC-4), a replenished cohort study of adult smokers. Our study focused on those who had quit smoking within the past year and prospectively examined the likelihood of smoking at the next survey wave, as a function of their extent of exposure to media campaign advertising. We hypothesized that among recent quitters, higher media campaign exposure, especially in the period soon after quitting, would be positively associated with not smoking at the next survey follow-up.

Methods

Design

Using date of data collection and postcode, we merged media market estimates of tobacco-control advertising exposure to a replenished cohort study of recent ex-smokers. Participants' demographic and smoking characteristics prior to quitting and advertising exposure in the period after quitting were used to predict smoking status 1 year later.

Longitudinal Survey Data

The ITC-4 is a prospective cohort study of a broadly population representative sample of over 2,000 adult smokers conducted in Canada, United States of America, United Kingdom, and Australia. Participants were recruited via random digit dialing telephone interviews and followed up annually. Additional participants were recruited yearly to replenish those lost to attrition. A detailed description of the aims and methods of the ITC project can be found in Thompson et al. (2006).

In the present study, participants were recent ex-smokers who were interviewed in at least one of the first six survey waves (2002–2007) of the Australian arm of the ITC survey and who also reported a valid smoking status at the subsequent wave (2003–2008). Participants eligible for the analysis were those

who reported they were not smoking at a given wave ("baseline quit") but were a smoker at the previous wave; in other words, given an average of 1 year between survey waves, they had quit within the past year and so were relatively recent quitters. Unfortunately in this study, we were unable to model the data around the *actual* start date of quit attempts. This is because of differential forgetting for attempts that occurred more than a month or so earlier (Borland et al., 2012), so equating for time quit at baseline would have introduced biases. In this paper, we use the term "baseline quit" to indicate the state of being quit at the baseline survey interview. It was possible for participants to contribute baseline-quit observations from multiple survey waves if they reported being quit at nonconsecutive baseline-quit waves (in other words, the participant quit smoking, relapsed, and then quit smoking again over the waves of data collection).

Initially, there were 1,767 baseline-quit observations. Those classified as a nonsmoker in the previous survey wave ($n = 587$) or who reported they had quit smoking more than 365 days ago ($n = 289$) were considered long-term quit observations and were ineligible for the analysis. Of the remaining 891 recent baseline-quit observations, 14 observations from the two Australian territories were excluded and 368 observations (42%) had no smoking status outcome measure available at the subsequent follow-up. Of the remaining 509 observations, a further 15 (3%) were missing at least one covariate, leaving a complete sample of 494 baseline-quit observations for analysis that could be classified as either quit or relapsed at the follow-up survey. Overall, 400 participants were eligible only once (contributing 400 observations), 35 participants were eligible twice (contributing 70 observations), and 8 participants were eligible three times (contributing 24 observations). Thus, in total, there were 494 quit observations from 443 participants across the six waves of data collection.

Antismoking Advertising Exposure Data

Occurrences of all tobacco-related advertisements appearing on television for the major metropolitan and regional Australian media markets from June 2002 to February 2008 were acquired from OzTAM Pty. Ltd. (North Sydney, Australia). Estimates of advertising exposure were assessed with television-monitoring devices and self-completion viewing diaries. Advertising exposure data are based on individual ratings of television programs and obtained by monitoring household audiences across media markets. Ratings provide an estimate of the percentage of households with televisions, who are watching a program in a media market over a specified period. The advertising exposure measure is based on gross ratings points (GRPs) per 3 months for the population aged 18 and older. We equated 100 GRPs with an average of one potential advertisement exposure per 3 months for all adults within a media market. GRPs represent average potential exposure: actual exposure for any given individual would vary on the basis of the frequency of actual television viewing and attention to the advertisements within television programs. GRPs were acquired for the tobacco-control advertising from Australian states and the national government or other public health organizations.

Measures and Analysis

Outcome Variable

The outcome was a binary variable representing whether a participant was quit (1) or smoking (0) at the next follow-up survey. The outcome measure was a point-prevalence measure of

Figure 1. Aggregation of GRPs in relation to timing of baseline interview and follow-up outcome measure.

quitting at follow-up so that some quitters may have relapsed and quit again during the 1-year follow-up period.

Exposure Variables (Tobacco-Control Advertising GRPs)

Variables representing each respondent's potential exposure to tobacco-control advertising prior to and after their baseline-quit survey date were constructed. Figure 1 shows that these variables were three-month aggregations of the GRPs occurring in the media market in which they resided prior to the date of the baseline-quit survey, then 0–3 months, 4–6 months, 7–9 months, and 10–12 months after the baseline-quit survey date. Participants were surveyed at different dates within a month, so aggregated GRPs were constructed case by case. Participants surveyed on the 1st–15th days of the month were assigned post baseline-quit GRPs for the 3 months including the current month of survey (i.e., 0 + 1 + 2 months post baseline quit), whereas those surveyed on 16th–31st were assigned post GRPs for the next 3 months excluding the current month (i.e., 1 + 2 + 3 months post-baseline quit).

Covariates

We adjusted for covariates that have previously been found to relate to the risk of relapse (Herd et al., 2009; Yong et al., 2010), including age, gender, socioeconomic status (SES), and state of residence. All were assessed at the initial wave of participation in the cohort study. The SES measure combined reported income and educational attainment (Wakefield et al., 2011): people with low SES having either income below AUD\$30,000 per annum or a low/moderate education level; people with middle SES having an income between AUD\$30,000 and AUD\$59,000 and a moderate education level, an income between AUD\$60,000 and AUD\$99,000 and low education, or an income below AUD\$30,000 and high education; people with high SES having income above AUD\$100,000, income between AUD\$30,000 and AUD\$59,000 and high education, or income between \$60,000 and \$99,000 and moderate education. Those with missing income data were classified on the basis of education alone.

Responses to the number of cigarettes smoked per day and time to first cigarette of the day were collected at the wave immediately prior to the eligible baseline-quit survey when the person still smoked. These variables were combined to form the Heaviness of Smoking Index (HSI; Heatherton, Kozlowski, Frecker, Rickert, &

Robinson, 1989), resulting in a 7-point scale ranging from 0 (*low*) to 6 (*highly addicted*). We also adjusted for the length of time an ex-smoker had been quit at the baseline-quit survey. Those who reported having quit were asked how many days/weeks/months it had been since they quit. We calculated a quit duration in days and, consistent with previous studies, used the log of the number of days since quitting (Herd et al., 2009; Yong et al., 2010). Other survey-related covariates were the number of months between survey waves, and the year of the baseline-quit survey.

Statistical Analysis

Pearson chi-square tests and two-sample Wilcoxon rank-sum tests compared the characteristics of those participants lost to follow-up to those included in the study.

We fitted Generalized Estimating Equations (GEE) to the data (Liang & Zeger, 1986) to account for the fact that there were multiple observations for some respondents and thus their error variance was not independent. A binomial distribution with logit link function was used, along with an exchangeable within-subject (working) correlation structure. Standard errors of the odds ratios were calculated using the Huber–White Sandwich Estimator.

We included key GRP exposure variables in the multi-variable analysis, as well as potential confounders identified a priori. A quasi-likelihood approach was used to determine if the covariates in the final model were acceptable in terms of model fit (Cui, 2007; Pan, 2001; Wedderburn, 1974). We tested if the association between the GRPs and being quit at follow-up was linear by comparing GEE models with and without the inclusion of a quadratic term, as well as a linear term for GRP. Although collinearity between per quarter exposure to antismoking advertising (GRPs) might be expected, the standard errors of the GRP exposure variables varied only slightly for univariable and multivariable analysis, so all were included in the model building process. In the final model, we tested for an interaction between GRPs and length of time quit in their linear form and also in a categorical form (GRPs: 0–199, 200–999, 1,000–1,999 and 2,000–4,000; time quit: <90 and ≥90 days), comparing the GEE models with and without interaction terms using the joint Wald test. Finally, the sensitivity of the results was tested by re-estimating the final model using bootstrap estimation with 2000 replications. All analyses were undertaken in Stata 11.1 software.

Table 1. Characteristics of Participants (*n* = 443) and Those Lost to Follow-Up/Missing Covariates (*n* = 246)

Variable	Lost to follow-up (<i>n</i> = 246), %	Participants (<i>n</i> = 443), %	Comparison tests
Age (years)			<i>p</i> = 0.02 ^b
18–24	22	14	
25–39	36	33	
40–54	29	39	
55+	13	14	
Sex (% male)	46	49	<i>p</i> = 0.38 ^b
Socioeconomic status			<i>p</i> = 0.39 ^b
Low	44	40	
Medium	22	27	
High	34	33	
State			<i>p</i> = 0.32 ^b
Victoria	22	28	
New South Wales	37	36	
Western Australia	10	9	
South Australia	8	5	
Tasmania	5	3	
Queensland	18	19	
Wave			<i>p</i> < 0.001 ^b
Wave 1: 2002–2003	3	5	
Wave 2: 2003–2004	18	24	
Wave 3: 2004–2005	20	29	
Wave 4: 2005–2006	22	21	
Wave 5: 2006–2007	18	13	
Wave 6: 2007–2008	19	8	
	(<i>n</i> = 241)	(<i>n</i> = 443)	
HSI ^a (median, 25th–75th percentile)	2 (0–3)	2 (0–3)	<i>p</i> = 0.22 ^c
Baseline-quit duration (days) (median, 25th–75th percentile)	120 (30–186)	90 (22–168)	<i>p</i> = 0.01 ^c

^aHSI = Heaviness of Smoking Index (range = 0–6) at wave prior to baseline quit.

^bPearson's chi-square test.

^cTwo-sample Wilcoxon rank-sum (Mann–Whitney) test.

Results

Table 1 shows that of the 443 participants, 53% were aged over 40 and 49% were male, with a relatively even distribution of SES. A majority of the sample (64%) came from New South Wales and Victoria. The median time quit was 90 days, whereas the median HSI in the wave prior to the baseline quit was 2. Table 1 shows baseline-quit comparisons of eligible participants (*n* = 443) and those who were lost to follow-up (*n* = 246). Most of the baseline-quit characteristics of those participants included in the analysis and those lost to follow-up were similar. However, compared with included participants, significantly more of those lost to follow-up were aged 18–39, had a longer baseline-quit duration, and were less likely to have been drawn from Wave 3 and more likely from Wave 6.

Table 2 shows average exposure to GRPs in the specified periods for the baseline-quit observations. As indicated by the 25th and 75th percentiles for GRPs, there was wide individual-level variation in advertising exposure within each time period examined, reflecting participants' residence in different media markets and the date of their baseline-quit survey. In general,

campaigns were not continuously broadcast over the period of study: typical campaigns lasted several months followed by a period of no broadcasting, and different states funded campaigns at different levels of GRPs.

Of the 494 eligible baseline-quit observations, 52% were quit at 12-month follow-up, and 48% had relapsed. Table 3 shows an initial multivariable model, which included all potentially important covariates. All quarterly exposure time periods were considered and only GRPs in the three-month post baseline-quit period were associated with a higher likelihood of being quit at follow-up. Of the other covariates, only a greater number of days since quitting at time of the baseline-quit interview were associated with quitting status at the 12-month follow-up.

The final multivariable model excluded all variables with no evidence of an association with the odds of being quit at follow-up, but retained state, to adjust for unobserved state-specific influences, and HSI, due to its common association with maintenance of quitting. The results suggest that an average increase in exposure of 100 GRPs (i.e., one antismoking advertisement)

Table 2. Mass Media Campaign Exposure for All Quit Observations ($n = 494$) in Periods Pre- and Post-Baseline-Quit Interview

	<i>N</i>	Median	25th percentile	75th percentile
0–3 months pre-baseline-quit interview	494	1,112	642	1,611
0–3 months post-baseline-quit interview	494	1,018	450	1,574
4–6 months post-baseline-quit interview	494	758	342	1,448
7–9 months post-baseline-quit interview	494	1,365	653	2,000
10–12 months post-baseline-quit interview	494	1,239	749	1,709
Exposure per participant in the 0–3 months post-baseline interview	<i>N</i> = 443	Median	25th percentile	75th percentile
Wave 1: 2002–2003	20	130	0	530
Wave 2: 2003–2004	108	570	450	1,044
Wave 3: 2004–2005	127	842	0	1,330
Wave 4: 2005–2006	95	1,649	1,435	2,379
Wave 5: 2006–2007	57	1,064	784	1,343
Wave 6: 2007–2008	36	972	396	2,038

in the 3-month period after the baseline-quit was associated with a 5% increase in the odds of not smoking at follow-up ($OR_{adj} = 1.05$, 95% CI: 1.02–1.07, $p < 0.001$). The inclusion of a squared GRPs term showed no statistical evidence for a nonlinear association (Wald test $p = 0.24$). Also, inclusion of a separate interaction term found no evidence to conclude that length of time quit prior to baseline modified the association between GRPs and the odds of being a nonsmoker at follow-up either when modeled linearly or in categorical form (Wald test $p = 0.49$). Finally, additional sensitivity analyses were conducted to explore the possibility that the success rates might have been artificially inflated due to cases that had relapsed and quit again being misclassified as a success. However, a model conducted without these cases (i.e., excluded if follow-up quitting status was achieved less than 6 months ago, $n = 43$ observations) revealed that the effect was still statistically significant in the 451 remaining observations, albeit attenuated ($OR_{adj} = 1.04$, 95% CI: 1.01–1.07, $p < 0.05$).

Using the final multivariable model, the probability of being quit at follow-up for different levels of tobacco-control GRPs in the 3 months after the baseline-quit was considered. These values were derived from predictions where GRPs are allowed to vary from their minimum observed value to the maximum, all other covariates were held constant. At a mean value of approximately 1,081 GRPs in the 3 months after baseline quit, the predicted probability of being quit at the next survey was 0.52 (52%). Based on the minimum (0) and maximum (3,541) GRPs, the predicted probabilities of staying quit were 0.41 (41%) and 0.74 (74%), respectively.

Discussion

Our findings suggest that greater exposure to mass media campaigns reduces the likelihood of relapse among recent quitters. The finding that all the observed effects were in the 3 months after being surveyed (and not the 4–6, 7–9 or 10–12 month periods) should not be taken to mean that it is only the first 3 months of a quit attempt that are critical for campaign exposure. It should be remembered that many recent quitters had been quit for some months prior to their date of baseline-quit

interview. The most likely explanation for the lack of effect of campaign exposure for periods beyond 3 months is that most of the relapse would have occurred sooner rather than later after the baseline interview since most quit attempts fail early on (Borland et al., 2012). Essentially, our findings suggest that media campaign exposure that occurs closer to the date of quitting probably matters more.

It is important to note that the media campaign messages in this study were not specifically designed to encourage recent quitters to sustain their quit attempts, but were largely messages stressing the serious harms of smoking for current smokers and were designed to prompt a quit attempt. These messages are still likely to be highly relevant for recent quitters, because Yong et al. (2010) found that two-thirds of those who had quit smoking for a year or more reported that they were still concerned about getting a smoking-related disease despite having quit. Media campaign messages in the period soon after quitting may assist recent quitters to remind themselves of the very good health reasons to quit smoking, resist urges to smoke, and more generally reinforce the value of having quit. Such messages are still likely to be valuable for medium-term quitters who still encounter strong urges to smoke, albeit more irregularly (Herd et al., 2009).

These findings imply that relatively frequent media campaigns are needed to benefit the many recent quitters in the population who quit at different times of the year. In this respect, our recommendation is consistent with that of previous studies in calling for ongoing cycles of mass media campaigns for most months of the year (Durkin et al., 2012). Each increase of 100 GRPs per quarter (i.e., each additional ad) was associated with a 5% increase in the likelihood of being quit at follow-up so that a 1,000 GRP increase per quarter (each additional 10 ads per quarter) improved quitting at follow-up by 50%. Also, these results suggest that tobacco-control policy changes that result in many additional smokers in the population trying to quit—such as tobacco tax increases, smoke-free laws, or introduction of pictorial health warnings—may be enhanced by the timely running of mass media campaigns to increase the likelihood that quit attempts will be sustained in the longer term (Alday et al., 2010;

Table 3. Association Between Antismoking Advertising (GRPs), Characteristics of Participants and Odds of Being Quit at 12 Months Follow-Up (N = 494 Quit Observations)

	Initial multivariable model			Final multivariable model		
	OR _{adj} ^{a,b}	95% CI	p value	OR _{adj} ^b	95% CI	p value
<i>GRPs per 100^c</i>						
Postbaseline GRPS 0–3 months	1.05	(1.02, 1.08)	0.004	1.05	(1.02, 1.07)	<0.001
Postbaseline GRPS 4–6 months	1.01	(0.97, 1.04)	0.637			
Postbaseline GRPS 7–9 months	0.99	(0.97, 1.02)	0.538			
Postbaseline GRPS 10–12 months	0.98	(0.95, 1.01)	0.204			
Prebaseline GRPS 0–3 months	1.00	(0.97, 1.03)	0.975			
Days since quit ^d	2.61	(1.78, 3.84)	< 0.001	2.49	(1.70, 3.64)	<0.001
Heavy Smoking Index	0.94	(0.84, 1.06)	0.321	0.96	(0.85, 1.07)	0.452
<i>State</i>						
Victoria	Ref			Ref		
New South Wales	1.12	(0.63, 2.00)	0.702	0.93	(0.57, 1.51)	0.765
Western Australia	1.26	(0.58, 2.73)	0.555	0.97	(0.49, 1.93)	0.928
South Australia	0.94	(0.33, 2.69)	0.909	0.93	(0.35, 2.49)	0.892
Tasmania	2.52	(0.78, 8.14)	0.122	2.22	(0.72, 6.87)	0.167
Queensland	1.09	(0.55, 2.15)	0.799	1.08	(0.60, 1.94)	0.808
<i>Age</i>						
18–24 years	Ref					
25–39 years	1.16	(0.60, 2.27)	0.659			
40–54 years	1.02	(0.52, 1.98)	0.958			
55+ years	1.30	(0.61, 2.76)	0.493			
<i>Socio economic status</i>						
Low SES	Ref					
Medium SES	0.81	(0.51, 1.28)	0.366			
High SES	0.94	(0.58, 1.53)	0.801			
<i>Sex</i>						
Females	Ref					
Males	1.29	(0.88, 1.90)	0.196			

^aAdjusted odds ratios; CI = confidence interval; OR = odds ratio; Ref = reference group.

^bModel adjusted for months between surveys and both the linear and the squared term of year of baseline-quit wave.

^c100 GRPs = each additional one ad per 3 month period.

^dLog10 scale so odds ratio represents association with a 10-fold increase in days since quit.

Brennan, Durkin, Cotter, Harper, & Wakefield, 2011; Dunlop, Perez, & Cotter, 2011). Such concurrent media campaigns may not necessarily need to make specific reference to the policy change but might simply broadcast messages pertaining to the need to quit smoking (Hammond et al., under review). Partos, Borland, Yong, Thrasher, & Hammond (in press) have shown that ex-smokers who report that health warnings on packs help them to stay quit are less likely to relapse over the next year. This further suggest that keeping the reasons for quitting salient can help ex-smokers resist temptations to smoke.

Our study has a number of limitations, most of which are inherent to the challenges of linking survey data to area-generated indices and others to the nature of the measures. For GRPs beyond the initial three-month postsurvey period, most of those who were going to relapse would have done so, so our capacity to find effects is limited. As noted above, this should not be taken to claim that these later periods are unimportant. In a previous work, we have shown that GRPs stimulate the occurrence of quit attempts (Wakefield et al., 2011).

Monthly surveys of recent quitters with more frequent follow-ups may provide a design more appropriate to examine such fine-grained associations. Another limitation is that once we established our eligible sample of recent quitters, we needed to drop around one-third because we had no data on their smoking status at follow-up. Those included in the analysis tended to be older, have been quit for a shorter time at the baseline-quit interview, and to be more likely to vary somewhat by wave, so our findings may not generalize to all recent quitters. We noted, however, that GRPs in the 3 months after baseline quit remained significant, even after adjusting for survey wave and length of time of baseline quit. Finally, GRPs estimate potential exposure to advertising and do not equate to actual individual exposure, although research shows that GRPs correlate well with recall of advertising (Southwell, Barmada, Hornik, & Maklan, 2002). That we could find effects with such crude measures suggests the actual relationship may be even stronger than the one we found. Another strength of the study was that campaign exposure was not related to any one specific campaign, but rather averaged across a number of cessation-focused campaigns with

strong health effects messages. However, this means, we cannot comment on whether different types of antismoking advertising are more likely to be effective than others, and this is an area for future research.

Overall, our findings provide the first prospective evidence for a possible beneficial role of mass media campaigns in reducing the likelihood of subsequent smoking among those who have recently quit and complement research showing beneficial effects on the initiation of attempts. These results provide additional evidence for allocating more resources toward regular cycles of mass media campaigns.

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Declaration of Interests

None declared.

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