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**Fear appeals in advanced tobacco control environments:
the impact of a National Mass Media Campaign in Norway**
Torleif Halkjelsvik^{1*}, Karl Erik Lund², Pål Kraft³ and Jostein Rise⁴

^{1, 2, 3 and 4} Norwegian Institute for Alcohol and Drug Research, Oslo, Norway

* Corresponding author: Norwegian Institute for Alcohol and Drug Research, P.b. 565 Sentrum, 0105 Oslo, NORWAY. Tel: +47 22 34 04 00; E-mail: th@sirus.no

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Media Campaign in Norway.

Torleif Halkjelsvik, Karl Erik Lund, Pål Kraft, & Jostein Rise
Norwegian Institute for Alcohol and Drug Research, Oslo, Norway

Corresponding author:

Torleif Halkjelsvik

Postal address: SIRUS, PB 565 Sentrum, 0105 Oslo, Norway

E-mail: th@sirus.no

Telephone: +47 98684762

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ABSTRACT

Norway has one of the most comprehensive infrastructures for tobacco control in the world and have launched several media campaigns recent years. Can yet another anti-smoking campaign, using fear appeal messages, have an immediate impact on smoking behavior, motivation to quit and health beliefs? A sample of smokers ($N=2543$) completed a survey before and after a seven-week national media campaign. Individual exposure to campaign (unaided recall) was used as predictor of change. We observed no statistically significant effect on smoking status but tendencies were in the expected direction for daily smokers ($p = .09$). There were no effects on number of cigarettes per day, likelihood to quit or reduce smoking. Small but statistically significant effects were found on motivation to quit ($p < .01$, $\eta_p^2 = .004$) and perceived seriousness of health hazards ($p < .05$, $\eta_p^2 = .002$). In addition, there was an increase in interpersonal discussions about health and smoking for those exposed to the campaign ($p < .01$, $\eta_p^2 = .008$). We conclude that there are very small effects of a relatively short and intense mass media campaign on a population of smokers already exposed to one of the most comprehensive tobacco control programs in the world.

In Norway, nearly all the political measures recommended by the World Health Organization for reducing smoking have been implemented, and the country holds one of the highest rankings on a European index of tobacco control activities.(1-3) The comprehensive tobacco legislation in Norway has included a total ban on all tobacco advertising (1975); legislation to protect people from passive smoking in the workplace, on public transport (1989), and places where food and drinks are served (2004); graphic health warnings on tobacco packaging (2010); and a ban against visible display of tobacco products (2010). At the same time, the real price of tobacco is high and has, by means of taxation, been steadily increased to reduce consumption. Norway has a 45-year tradition of tobacco control. The country was one of the first in the world to enact a comprehensive tobacco control act with a subsequent decline in smoking prevalence. (4) Since 1997, the Directorate of Health has administered a nationwide school-based tobacco prevention program. Fifty-six per cent of students in junior high school (age 13–15 years) participate in the program annually. In 2004, a national smoking cessation guideline for general practitioners was published by the Directorate of Health. Additionally, the use of mass media campaigns has been intensified after 2003.

The efforts of the authorities have likely contributed to the halving of male smokers since the 1970s, and may also have limited the increase in women's smoking throughout the 1970 and -80s and eventually turned it to a downward trend. In 1973, there were more than twice as many smokers as former smokers in the population, but this ratio was 1:1 in 2009(5). The prevalence of daily smoking in 2011 was 17%.(6) According to a recent study the full potential for behavioral change in the Norwegian smoking population is not yet utilized.(7) This poses the question of which further actions to take in order to maintain the decline in smoking prevalence.

The World Health Organization's recent assessment of the infrastructure for tobacco control in Norway points to several potential improvements(4). A special attention to high-prevalence groups, including long-term smokers and pregnant women, was recommended. It was noted that smoke-free provisions do not fully comply with the WHO Framework Convention on Tobacco Control (FCTC), Article 8 guidelines(8), and that children in private spaces remain relatively unprotected from second-hand smoke. According to the assessment, the smoking cessation services are limited, sporadic and not easily available to all smokers, with a lack of coordination nationally, regionally and locally. Furthermore, the health warnings and their enforcement should be in line with WHO FCTC guidelines and plain packaging should be considered. In addition to the above potential improvements, the report criticized the amount of resources devoted to mass media campaigns, and the lack of an overall plan for future campaigns. As one of the few western countries not affected by the recent financial crisis, the government was able to increase funding of anti-tobacco campaigns. Currently, about US\$25 per capita per year is spent exclusively on anti-tobacco messages transmitted through television.

Throughout the period 2003 to early 2012, the health authorities have launched five extensive campaigns through national media channels. Although each campaign have lasted only a few months, the reach has been quite high, with 80-90% of the Norwegian population noticing a single campaign.(9) Three of the campaigns have been based on fear appeal messages focusing on smoking-related diseases using emotional testimonials in dramatic settings (See (10) for a theoretical review of fear appeal messages). The present study investigated the impact of the fifth and last of these campaigns. Could a seven-week national mass media campaign, using fear appeal messages, produce any effects on smoking behavior and cognitions in a population of smokers already for many years exposed to one of the most robust infrastructure for tobacco control in the world?

Research on tobacco control media interventions indicates that campaigns can educate about the harms of smoking, set the agenda for discussion, change smoking beliefs and attitudes, increase strength of quitting intentions and number of quit attempts, and reduce smoking prevalence.(11, 12) However, the results are mixed and difficult to interpret,(13) and several of the studies may not be relevant to the current context as they were carried out in countries which were at a less progressed stage on the historical diffusion curve of cigarette smoking.(14) Furthermore, very few of the recent studies on media-only interventions concern the immediate impact of relatively short campaigns, and few of the evaluated campaigns target entire nations.

Studies utilizing data from longer periods of time suggest that the amount of exposure to anti-smoking commercials during the recent months can exert an influence on smoking prevalence.(15-17) However, results on the short term impact of individual campaigns in recent years have been mixed. An evaluation of the Australian National Tobacco Campaign in 1997 showed a significant increase in an index of various items related to smoking status and quitting after only one week, with a peak after seven weeks of the campaign (2-4 weeks after the most intense media exposure).(18) Interestingly, no such effects were identified in the less intense phase two and three of the campaigns which took place from 1998 to 2000. Two weeks into the 2001 Australian National Tobacco Campaign there were tendencies of more progression towards quitting and more negative thoughts about smoking among those exposed to the campaign compared to those not exposed to the campaign.(19) However, the former result was not statistically significant and the latter was accompanied by an increase in *positive* thoughts about smoking. Although not a national intervention, the impact of a mass media campaign in British Columbia showed no significant short term effect on smoking prevalence in the targeted area compared to the rest of Canada, but there seemed to be a weaker increase in number of cigarettes smoked for the targeted area.(20) We assume that

similar campaigns may have been evaluated in other countries as well. However, it seems like such evaluations rarely find their way to the research literature.

The above results indicate a need for more research on the immediate impact of individual anti-smoking mass media campaigns. The particular Norwegian context may also be suitable for identifying possible limitations of mass media campaigns in countries with comprehensive tobacco control programs. In the current study we were interested in potential changes produced by an intensive seven-week national mass media campaign on smoking status and consumption, motivation to quit or reduce smoking, and overall perceptions of smoking-related health risks. In addition to the above more direct measures of smoking-related behavior and cognitions, we also investigated the impact of the campaign on interpersonal discussions about health and smoking.

METHOD

The 2012 National Campaign

During the first seven weeks of 2012 four different 30-second videos were shown a total of 1774 times on the largest commercial television channels in Norway. This corresponds to an estimated total of 1220 Target Rating Points (number of exposures multiplied by the percentage reach of the campaign). The videos were also available on YouTube, Facebook, and through the largest web-based newspapers in Norway. In addition, three printed ads were placed in some of the largest newspapers and magazines a total of 34 times. The material was adopted from Australian campaigns and contained materials deemed to invoke strong reactions in the audience. English versions of the commercials are available at www.worldlungfoundation.org/mmr (Sponge, Carotid, Voice Within, and Bubble Wrap). The goal of the campaign was to promote change through fear appeals, and to inform that smoking can cause stroke, cancer and emphysema. A forced exposure test where 973 Norwegian

smokers received one of the four video ads or a more neutral still ad revealed that all campaign ads, except Bubble Wrap, was rated as significantly more fearful than the neutral control ad. All four campaign ads were rated as significantly more disgusting than the control ad. The campaign commercials ended with the encouragement: “You can do it!”, before information about a quit line and a web-page to aid the cessation attempts was provided.

Web-based questionnaires were distributed during the three weeks preceding the campaign, in December 2011, and immediately after the campaign, in late February 2012. Eighty-seven percent of the post-campaign responses were collected within the two weeks following the campaign, and the remaining responses were collected within the two next weeks.

Sampling and Response

An independent research agency collected data from a sample of smokers included in a web-panel of more than 62 000 Norwegians and a postal database of more than 15 000 Norwegians. The web panel originated from previous national representative population surveys, carried out by telephone, post or personal interview. Response rates of initial (recruitment) surveys typically ranged from 20% to 25%, and the proportion of respondents who agreed to participate in future surveys as members of the web panel was about 50%. The postal database consisted of participants from unrelated postal surveys administered by the independent research agency. Recruitment for these initial surveys was done through telephone interviews. Typically, about 45 % agreed to participate in these initial surveys, 40% of those who agreed to participate completed the surveys, and 70% of those who completed the surveys agreed to be recontacted. The postal database used in recruitment for the current study consisted of those who agreed to be recontacted.

An invitation was sent to those who in previous surveys had indicated that they were smokers or snus users (14 513 from the web-panel and 2 756 from the postal database).

Initially, 6288 responded, but only 4008 were smokers at the moment. After excluding 80 respondents who answered inconsistently on two questions about smoking status at baseline or follow-up, and a further 1385 who dropped out before the second measurement, the final material consisted of 2543 respondents. In comparison with the data from a telephone survey on smoking habits by Statistics Norway,(6) the current sample was similar in terms of the balance between genders, but, as typically found for internet samples, different in terms of education. Respondents with a higher education made up 30.7% of the current sample of smokers, but only 16.4% of the smokers in the telephone survey.

Outcome Measures

Smoking status was assessed with two items. One item asked the respondents whether they smoke daily, occasionally, or do not smoke. Another item asked which of four descriptions best fit respondents smoking habits: "I smoke daily now." "I smoked daily before, but now occasionally." "I smoke occasionally now and have never been a daily smoker." "I neither smoke daily nor occasionally." We only included respondents with a consistent pattern on these two questions. In addition to the above categories the survey also included an open-ended measure of the number of cigarettes per day for daily smokers.

One item, on a response scale from 1 (completely disagree) to 5 (completely agree), asked whether one agreed to the following statement: "I wish to stop smoking". In addition to this single-item measure of motivation to quit, respondents also indicated how likely it was that they would quit in the next 6 months/3 months/30 days, and how likely it was that they would reduce smoking in the next 6 months/3 months/30 days. The three items measuring the likelihood to quit and the three items measuring the likelihood to reduce smoking were highly correlated and therefore aggregated into a likelihood to quit index ($\alpha = .91$ for both measurements) and a likelihood to reduce smoking index (baseline $\alpha = .94$; post-campaign $\alpha = .95$).

Subjective health risk was measured by the perceived seriousness of smoking-related health hazards, answered on a scale from 1 ("Not serious") to 5 ("Very serious"), and the level of health risk associated with daily smoking of cigarettes, answered on a scale from 1 ("Very low risk") to 7 ("Very high risk").

In order to assess the ability of the campaign to set the agenda and stimulate discussion, one question asked how often in the past 5-6 weeks respondents had discussed health and smoking with others. The question was answered on a 5-point scale from "Never" to "Very often".

Predictor variable

The videos contained strong images and messages, and it was therefore expected that those who were exposed to the campaign would remember having seen the commercials. Based on this assumption we compared the changes of those who reported, by means of unaided recall, that they had noticed one or more of the video ads on TV or on the internet with those who did not recall the videos. Participants were informed that an anti-smoking campaign by the Directorate of Health had recently been shown during commercial breaks on some TV-channels and published on the internet, and that the videos contained short films where harmful effects of smoking were described. Participants were asked whether they had noticed this campaign either on TV or on the internet. Those who recalled having seen the campaign were classified as "Exposed" and those who did not recall the campaign were classified as "Unexposed".

Data analysis

We tested baseline differences between the exposed and unexposed groups with Chi-Square Tests and T-Tests. Differences between exposed and unexposed participants in smoking status was investigated with a multinomial logistic regression, and for all other main

analyses we used ANCOVAs. In addition, simple change scores were analysed with paired-sample t-tests (95% confidence intervals of differences are reported in Table 3).

RESULTS

Exposed vs. Unexposed

Of 2543 participants, 1761 had noticed the commercials on TV, and 202 participants had noticed the commercials on the internet. Forty-four participants reported having seen the commercials on internet only. Compared to those who did not recall having seen the videos (*unexposed group*), those who noticed the videos (*exposed group*) was slightly younger, consisted of more female respondents, had a lower level of education, more quit attempts, and fewer years as smokers (See Table 1). Accordingly, the above variables were controlled for in the analyses reported in the last column of Table 1 (Adjusted Models). There were no statistically significant differences between the two groups on number of cigarettes per day, $p = .18$, no difference in percentage of smokers with a New Year's resolution to quit, $p = .73$, and no differences on the demographic variables total household income, number of household members, marital status, and home place urbanity, all $ps > .69$.

Table 1. Baseline characteristics of smokers exposed to the campaign and not exposed to the campaign.

		Exposed		Unexposed		Effect
		<i>n</i>	<i>M</i> or (%)	<i>n</i>	<i>M</i> or (%)	size ϕ/η
Age		1803	48.54	738	51.02	.098**
	(<i>SD</i>)		(11.36)		(11.48)	
Gender	Male	856	(47.5)	425	(57.6)	
	Female	947	(52.5)	313	(42.4)	
	χ^2 Test					.092**
Education	Lower	1249	(69.2)	472	(64.0)	
	Higher	525	(29.1)	255	(34.6)	
	Student ^b	31	(1.7)	11	(1.5)	
	χ^2 Test					.054*
Quit attempts		1805	2.85	738	2.44	.044*
	(<i>SD</i>)		(4.56)		(3.09)	
Years smoking		1805	28.23	738	29.92	.064**
	(<i>SD</i>)		(11.77)		(12.37)	
Cigarettes per day ^a		1404	13.45	538	13.90	.030
	(<i>SD</i>)		(6.56)		(7.11)	
New Year's resolution	Yes	106	(94.1)	46	(93.8)	
	No/Undecided	1699	(5.9)	692	(6.2)	.007
	χ^2 Test					

Note. ** $p < .001$; * $p < .05$; ^a Daily smokers only; ^b Due to few observations we excluded the student group from analyses with education as control variable.

Main Analyses

Baseline smoking status crossed with post-campaign smoking status can be found in Table 2. We were most interested in the daily smokers, since we sampled from a population defining themselves as smokers, and since there were fewer of the more diverse occasional smokers.

Table 2. *Changes in smoking status from baseline to post-campaign for respondents exposed to and not exposed to the campaign.*

Baseline smoking status		Post-campaign smoking status		
		Daily	Occasional	Non-smoker
Daily smoker	Exposed	90.6% (1276)	5.0% (70)	4.5% (63)
	Unexposed	93.2% (507)	4.2% (23)	2.6% (14)
	Total	91.3% (1783)	4.8% (93)	3.9% (77)
Occasional smoker	Exposed	11.4% (45)	81.8% (324)	6.8% (27)
	Unexposed	8.8% (17)	85.1% (165)	6.2% (12)
	Total	10.5% (62)	82.9% (489)	6.6% (39)

Using data from daily smokers at baseline only, we performed a nominal logistic regression on post-campaign smoking status (daily, occasional, or non-smoker, with the former as the reference category) with exposure to the campaign as the independent variable. In a model without control variables the effect of exposure to the campaign gave an overall $p = .097$ ($\chi^2 = 4.669$), and $p = .053$ for the change from daily smoker to non-smoker, $OR = 1.788$, $CI^{95\%} = .993$ to 3.220 . There were no indications of an effect from exposure to the campaign on change from daily to occasional smoking, $p > .44$. A regression adjusted for all control variables gave $p = .088$ for the overall campaign exposure factor, $p = .121$ for the effect of campaign exposure on change from daily smoker to non-smoker, $OR = 1.604$, $CI^{95\%} = .882$ to 2.915 , and $p = .128$ for the effect of campaign exposure on change from daily smoker to occasional smoker, $OR = 1.504$, $CI^{95\%} = .889$ to 2.544 . Although the results did not reach conventional levels of statistical significance, the tendency was in the predicted direction, with a point estimate that would correspond to a 60% higher probability of quitting for the exposed group compared to the unexposed group. There was no effect of campaign exposure on baseline occasional smokers, $p = .575$ for overall effect.

For those who were daily smokers at both measurements and reported being exposed to the campaign there was a significant reduction in number of cigarettes from baseline ($M = 13.64$, $SD = 6.14$) to follow-up ($M = 13.41$, $SD = 6.03$), $t(1269) = 2.618$, $p = .009$. However, there was also a reduction for those not exposed to the campaign (baseline $M = 14.15$, $SD = 7.14$; follow-up $M = 13.82$, $SD = 7.26$), $t(497) = 2.491$, $p = .013$, and the difference between groups was not significant.

On a question whether respondents had a wish to quit smoking there was no significant change from baseline to follow-up for those exposed to the campaign, $t(1714) = .738$, $p = .461$, and no significant change for unexposed respondents, $t(711) = 1.494$, $p = .136$ (See Table 3). However, an ANCOVA controlling for baseline variables showed a statistically significant difference between groups. This was due to the combination of a small decrease in motivation for the unexposed group, and a negligible increase in the exposed group.

Table 3. Means and standard deviations for motivational and health risk variables as a function of campaign exposure, 95% confidence interval of differences from baseline to follow-up, and tests of campaign exposure, controlling for baseline.

		Time				CI ^{95%} of difference ^a	Effect size η_p^2	
		Baseline		Follow-up			Unadj.	Adj.
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Wish to Quit	Exposed	3.53	1.26	3.55	1.25	-.03 to .06		
	Unexposed	3.36	1.29	3.31	1.29	-.12 to .02		
	ANCOVA ^b						.004 ^{**}	.004 ^{**}
Likelihood to Quit	Exposed	2.86	1.44	2.86	1.41	-.05 to .06		
	Unexposed	2.82	1.44	2.80	1.41	-.03 to .07		
	ANCOVA ^b						.000	.000
Likelihood to Reduce	Exposed	3.65	1.54	3.66	1.54	-.05 to .07		
	Unexposed	3.50	1.58	3.50	1.59	-.10 to .09		
	ANCOVA ^b						.001	.001
Hazard Seriousness	Exposed	3.98	.96	4.07	.96	.04 to .12		
	Unexposed	3.85	1.04	3.90	1.05	-.02 to .11		
	ANCOVA ^c						.002 [*]	.002 [*]
Risk from Daily Use	Exposed	5.92	1.10	6.01	1.04	.04 to .13		
	Unexposed	5.83	1.10	5.87	1.07	-.02 to .12		
	ANCOVA ^c						.002 [*]	.001
Smoking and Health Discussions	Exposed	2.59	1.03	2.70	1.04	.07 to .16		
	Unexposed	2.34	1.00	2.38	1.00	-.03 to .11		
	ANCOVA ^b						.009 ^{**}	.008 ^{**}

Note. ^{*} $p < .05$; ^{**} $p < .01$. ^a Post-campaign minus baseline (a higher change score indicates a higher post-campaign score); ^b Exposed $n = 1715$, Unexposed $n = 712$; ^c Exposed $n = 1805$, Unexposed $n = 738$; Abbreviations. Unadj. = Unadjusted model, only controlled for baseline of dependent. Adj. = Adjusted model, controlled for baseline of dependent and other baseline variables.

There was no improvement in subjective likelihood to quit (*Likelihood to Quit*) for those exposed to the campaign, $t(1714) = .098, p = .922$, and no improvement for those not exposed to the campaign, $t(711) = .487, p = .627$. The likelihood to reduce smoking (*Likelihood to Reduce*) did not change for those exposed to the campaign, $t(1714) = .329, p = .743$, or for those not exposed to the campaign, $t(711) = .111, p = .911$. The difference in the level of change between the two groups on the two above measures were not significant.

On the item about the seriousness of smoking-related health hazards (*Hazard Seriousness*) there was a statistically significant increase for those exposed to the campaign, $t(1804) = 4.060, p < .001$, and no significant change for those not exposed to the campaign, $t(737) = 1.512, p = .13$. The difference between unexposed and exposed groups were statistically significant, indicating a stronger increase in perceived seriousness for the exposed compared to the non-exposed group. The item about risk associated with daily smoking of cigarettes (*Risk from Daily Use*) showed a similar pattern. Those exposed to the campaign, $t(1804) = 3.917, p < .001$ changed slightly more towards higher perceived risk of daily smoking than the unexposed, $t(737) = .1366, p = .172$. However, the difference did not reach conventional levels of statistical significance, $p = .162$.

There was no significant change in the frequency of recent smoking-related discussions (*Smoking and Health Discussions*) among those not exposed to the campaign, $t(711) = 1.102, p = .271$, whereas a statistically significant change was expressed by the exposed respondents, $t(1714) = 5.148, p < .001$. The difference between the groups was also statistically significant. Thus, it appears as the campaign stimulated discussions about smoking and health.

DISCUSSION AND CONCLUSION

We investigated the short term effects of a national anti-smoking campaign in Norway by comparing the estimated change from those exposed to the campaign with those not

exposed to the campaign. First, as to smoking status, there was a higher rate of change for daily smokers exposed to the campaign compared to unexposed daily smokers, but the tendency was not statistically significant. Second, there were statistically significant reductions of cigarette consumption among those exposed to the campaign, but also among those not exposed to the campaign. The difference in reduction between the groups was not statistically significant. Third, the estimated change in motivation to quit differed slightly between exposed and unexposed respondents, and this seemed to be mainly caused by a slight decrease from baseline to follow-up for the unexposed group. Fourth, two indices of the subjective likelihood to reduce or quit smoking showed no significant improvements across measurements. Note that the above analyses on motivation and likelihood does not take into account the improvement of those who manage to quit, since there was no data on motivation to quit for non-smokers.

Fifth, the perceived seriousness of smoking-related health hazards, and the perceived risk of daily cigarette consumption changed slightly from baseline to post campaign for those exposed to the campaign, but not for unexposed respondents. The difference in change between exposed and unexposed smokers was statistically significant in the former case, but the latter tendency was not. In addition to the indications of very small effects on some of the smoking-related outcomes, the campaign seemed to have stimulated interpersonal discussions about health and smoking. The effect on interpersonal discussions was the strongest in the study, but still below 1% explained variance after baseline variables were partialled out.

The recruitment through web panels may be problematic for the generalization of the results. Selection bias may have occurred at one or more of the stages of the sampling process, and in comparison with data from a nationally representative telephone survey the current data includes more respondents with a higher education. It is also not unreasonable to assume that smokers who choose to participate in a survey about smoking are more motivated

to change than those who decline. Still, it is difficult to see how this may have impacted the comparison of exposed and unexposed respondents, and if the sample represents a particular group of smokers (e.g., highly educated smokers), the current results would at least be relevant for this sub-population of smokers.

The assumed effects of the campaign relies on several assumptions regarding the comparability of unexposed and exposed respondents. Before the main analyses we assessed differences between exposed and unexposed respondents on potentially confounding variables and found that the groups differed on some characteristics. Even when controlling for these variables we cannot rule out the possibility that initial unmeasured differences led to the observed patterns of change. Another serious problem could be that those who change their smoking behavior could be more likely to remember the commercials. Comparing exposed with unexposed respondents is therefore not the optimal research design for evaluating a mass media campaign,(12) but given the present circumstances (campaign delivered through national media channels) and the assumption that the vivid campaign material is likely to be remembered, we find the approach defensible. The fact that almost 87% of the data was collected within the first two weeks following the campaign also suggests that the exposed group would remember the fearful messages .

In addition to the potential problem that those classified as unexposed may have seen the commercials without being able to recall this, factors such as communication between exposed and unexposed respondents,(21) indirect influence through media coverage, and an overall focus on smoking in the society provoked by the campaign could also undermine effects in group comparisons. For this reason it may be appropriate not only to consider differences between exposed and unexposed participant, but also changes from baseline to post-campaign for both groups. As evident from Table 2, there is only positive change from baseline to post-campaign for the measures on which we also found differences between

groups, except for number of cigarettes consumed. This means that even if we were able to control for indirect effects of the campaign on the unexposed group, we would still obtain approximately the same pattern of results.

The campaign was carried out within the first seven weeks of the year, and 6% of the respondents reported having a New Year's resolution to quit. This may have undermined our ability to detect an impact of the campaign if thoughts about quitting was already easily accessible for both exposed and unexposed respondents.

The fact that effects were very small for some of the measures and absent for others might be related to past exposure to strong anti-smoking messages in media and on tobacco packaging, and the general high level of tobacco control. However, as outlined in the introduction, it is not uncommon to find mixed or negligible effects in evaluations of mass media campaigns.(11-13) The present campaign relied on content that is likely to evoke feelings of disgust (e.g., a carotid surgery) in addition to fear. Recent experimental research indicate that disgust may disrupt message processing in fear appeals,(22, 23) however, there is little research on disgust in more naturalistic settings. In addition, meta-analyses indicates that threat messages only promote behavior change when people believe they can perform the desired action,(24, 25) a belief which may have been insufficiently targeted by the campaign.

It is difficult to speculate about the practical implications of the very small effect sizes for measures of motivation to quit and for health beliefs, but the results indicate that the campaign likely affected the population in some sense. The increase in interpersonal discussions among the exposed respondents, may also point to potential long term changes through social norms.(26)

While keeping the limitations of the current research context and design in mind, we conclude that there seems to be small benefits of an intense seven-week anti-smoking mass media campaign on a population exposed to one of the most comprehensive tobacco control

programs in the world. On the one hand, there was no effect at all on likelihood to quit and likelihood to reduce smoking and there was a reduction in number of cigarettes a day both for smokers exposed to the campaign and for smokers not exposed to the campaign. On the other hand, the remaining results revealed patterns that, taken together, were suggestive of a positive impact of the campaign. Measures of quit rate and perceived risk did not give any significant results, but showed tendencies in the expected directions, and we found statistically significant differences in measures of perceived seriousness of smoking-related health hazards and wish to quit. In addition, the result with the relatively strongest, but still minuscule, effect, suggested that the campaign inspired smokers to discuss issues relating to smoking and health.

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