Effect of the first federally funded US antismoking national media campaign

Tim McAfee, Kevin C Davis, Robert L Alexander Jr, Terry F Pechacek, Rebecca Bunnell

Summary

Background Every year, smoking kills more than 5 million people globally, including 440 000 people in the USA, where the long-term decline in smoking prevalence has slowed. The US Centers for Disease Control and Prevention (CDC) delivered a national, 3-month antismoking campaign called Tips From Former Smokers (Tips) that started in March, 2012, in which hard-hitting, emotionally evocative television advertising was featured, depicting smoking-related suffering in real people. We aimed to assess the effects of the Tips campaign.

Methods We undertook baseline and follow-up surveys of nationally representative cohorts of adult smokers and non-smokers. The national effect of the Tips campaign was estimated by applying rates of change in the cohort before and after the campaign to US census data.

Findings 3051 smokers and 2220 non-smokers completed baseline and follow-up assessments. 2395 (78%) smokers and 1632 (74%) non-smokers recalled seeing at least one Tips advertisement on television during the 3-month campaign. Quit attempts among smokers rose from 31·1% (95% CI 30·3–31·9) at baseline to 34·8% (34·0–35·7) at follow-up, a 12% relative increase. The prevalence of abstinence at follow-up among smokers who made a quit attempt was 13·4% (95% CI 9·7–17·2). Nationally, an estimated 1·64 million additional smokers made a quit attempt, and 220 000 (95% CI 159 000–282 000) remained abstinent at follow-up. Recommendations by non-smokers to quit grew from 2·6% at baseline to 5·1% at follow-up, and the prevalence of people talking with friends and family about the dangers of smoking rose from 31·9% (95% CI 31·3–32·5) to 35·2% (34·6–35·9), resulting in an estimated 4·7 million additional non-smokers recommending cessation services and more than 6 million talking about the dangers of smoking.

Interpretation The high-exposure Tips media campaign was effective at increasing population-level quit attempts. The growth in smokers who quit and became sustained quitters could have added from a third to almost half a million quality-adjusted life-years to the US population. Expanded implementation of similar campaigns globally could accelerate progress on the WHO Framework Convention on Tobacco Control and reduce smoking prevalence globally.

Funding CDC, US Department of Health and Human Services.

Introduction Tobacco use remains the leading cause of preventable death worldwide, causing nearly 5 million deaths annually.1 For individuals, smoking shortens life expectancy by more than 10 years,2 whereas adults who quit before age 45 years regain almost a decade in life expectancy.2 Every year in the USA, cigarettes kill more than 440 000 people4,6 and cost US$96 billion in direct medical costs and $97 billion in lost productivity.7 Despite these striking statistics, the long-term decline in smoking in the USA has slowed in recent years.5,7–9 Although 50% of US smokers attempt to quit every year,7 the annual sustained cessation rate remains around 5%.5,9 Intervention by doctors can increase quit rates, but competing demands, inadequate reimbursement policies, and insufficient training constrain their ability to reach the 45 million smokers in the USA.8 State and local mass-media campaigns have motivated smokers to quit,10–13 but these initiatives have typically been done sporadically or at low exposure levels. States vary widely by campaign implementation; a few (such as California and New York) have run consistent media campaigns for many years, whereas others have either never run media campaigns or have made intermittent efforts at low doses. Globally, several national media campaigns have taken place, but assessments of these have been based largely on regional samples, evaluated multiple state-based campaigns at the national level, used surrogate markers for quit-attempt rates, relied on differences in self-reported exposure to advertising, or used samples without prospective cohort designs or excluding non-smokers.14–18

In the USA, the Patient Protection and Affordable Care Act 2010 (ACA) provides opportunities to accelerate national progress in tackling tobacco use,4 including enhanced reimbursements for cessation services and mass-media support. In 2012, through the ACA, the US Centers for Disease Control and Prevention (CDC) launched the first, federally funded, national, anti-smoking, mass-media education campaign—Tips From Former Smokers (Tips). This $54 million initiative featured emotional true stories told by former smokers to increase awareness of the human suffering caused by smoking, encourage quitting, and motivate non-smokers to communicate with family and friends about the
dangers of smoking. We aimed to measure changes in quit attempts by smokers, quit status at follow-up, and non-smokers' cessation support behaviour in nationally representative cohorts of smokers and non-smokers and to estimate the effect of the campaign nationally by applying cohort rates to US census data.

**Methods**

**Study design**

Advertisement development in the Tips campaign built on experiences from several countries\(^1\) and underwent rigorous formative testing\(^2\) with almost 10000 smokers and non-smokers. Creative development first looked at the relevance and effect of potential messages, then multiple campaign ideas were assessed. Before production of the final advertisements, refinements were identified by screen-testing of rough versions online. On the basis of smokers’ feedback, emotionally evocative and graphic advertisements emphasised the effect of smoking-related illness on quality of life, rather than focusing on smoking as a cause of mortality. Former smokers with smoking-related illnesses were recruited, and clinical and epidemiological case reviews were done not only by doctors involved in the individual’s care but also by CDC clinicians and national experts who verified that the illnesses were attributable to smoking. Advertisements not only depicted patients with smoking-related heart disease, Buerger’s disease, asthma, head and neck cancer, and stroke but also showed people who had quit smoking successfully and were healthy.

The 12-week Tips campaign started on March 19, 2012, and finished on June 10, 2012, with sufficient media placement to reach three-quarters of US adults multiple times, consistent with CDC’s recommended best practices.\(^3\) Advertisements appeared on television in all US media markets via a national buy of commercial advertisement time on cable television networks. Additionally, the Tips campaign was broadcast via smaller local television channels in media markets with a high smoking prevalence, covering 28% of the US population. Overall, enough Tips advertisements were broadcast for about four out of five smokers to see at least one message, with those who saw any advertisement averaging about 13 views over the 12-week period. In addition to paid media exposure, the campaign also generated considerable earned (unpaid) exposure, with more than 1844 television and radio stories and an overall earned media publicity value of $4.6 million. Of television advertisements, about a third were tagged with 1-800-QUIT-NOW, linking viewers to their state telephone helpline, and about two-thirds carried a link to www.smokefree.gov, the National Cancer Institute’s quit assistance website. Advertisements and campaign information from Tips can be viewed on the CDC’s website (appendix, pp 1–2). The campaign also featured radio, print, billboard, and digital and website advertisements, in addition to Spanish versions. The figure shows a print advertisement.

**Participants**

To select a panel of individuals for inclusion in our study, we used KnowledgePanel (GfK Knowledge Networks, Palo Alto, CA, USA), a probability-based, nationally representative, online survey resource. Initial recruitment was done by random sampling of addresses; KnowledgePanel’s address-based sampling recruitment covers almost all residential postal addresses in the USA, including those with mobile phones and households without internet access that many telephone surveys miss. Selected households were invited to join our study panel through a series of mailings and telephone follow-up calls to non-responders with an address-matched phone number. All KnowledgePanel participants were sampled with a known probability of selection; unlike internet-based convenience samples, no one can volunteer to participate in KnowledgePanel. All participants had to be recruited actively through the probability-based, address-based sampling procedure.

Potential participants were identified initially from the overall KnowledgePanel selection, on the basis of existing profile characteristics. We defined current smokers as adults aged 18 years or older who had smoked at least 100 cigarettes in their lifetime and who reported now smoking either every day or some days. Non-smokers
were adults aged 18 years or older who did not meet the definition of current smoker.

All existing smokers in the panel (n=5903), and a random sample of non-smokers, were invited to participate. Both the smoker and non-smoker samples were powered to generate national estimates. We invited selected individuals to participate in our study via an email containing a link to the online survey. People clicking the link were routed to an online survey screener to confirm study eligibility. Those meeting eligibility criteria provided their consent before answering the main questionnaire. The baseline survey was done before the Tips campaign began, from Feb 21, 2012, to March 18, 2012; follow-up was done immediately after the campaign ended, between June 11, 2012, and July 5, 2012. The evaluation protocol received institutional review board approval on Dec 5, 2011.

Statistical analysis
We created dichotomous outcome variables for any versus no quit attempt of 1 day or longer among smokers and for any versus no cessation recommendations or discussions about the dangers of smoking with friends or family among non-smokers over the previous 3 months. For smokers, we included exact baseline survey dates in the follow-up questionnaire to facilitate 3-month recall of quit attempts. At follow-up, we asked smokers if they currently smoked every day, some days, or not at all. We defined the prevalence of abstinence at follow-up as the proportion of baseline smokers who reported having made a quit attempt in the past 3 months at follow-up who also reported both non-smoker status and smoking zero cigarettes a day.

We measured Tips campaign awareness at follow-up by showing television advertisements with video-streaming within the online survey and asking participants how often they had seen every video during the past 3 months. We assessed awareness of Tips media (eg, including print and radio) after asking all other questions.

Our analyses included covariates used elsewhere to assess the effect of media interventions on quit attempts and other smoking-related outcomes.\(^{21}\) Control variables included age, education, sex, ethnic origin, income, experience taking tobacco-related surveys, cigarette addiction (measured as time [in min] until first cigarette after waking [smokers only]), presence of household smokers, time spent watching television in a day (measured in h), presence of children in household, self-reported chronic condition, self-reported mental health condition, media market population size, median income and education, and state-level cigarette taxes and tobacco-control funding (appendix, pp 3–6).

We used a multivariate logistic regression model, incorporating pooled baseline and follow-up data, to predict population changes in making at least one quit attempt in the past 3 months among smokers before and after the Tips campaign. Similar models were used to predict proportions of non-smokers before and after the campaign who talked with friends or family about the dangers of smoking or recommended cessation resources. Because these models included observations on unique individuals at two points in time, we adjusted model estimates for the fraction of individuals measured at each time point in both the numerator and denominator of the quit attempt estimate. We also stratified by sex to account for differences in the proportion of smokers at each time point (eg, women are less likely to be current smokers than men).
clustering of data on individuals, ordered on time. All models included the control variables described above. In addition to our before-and-after analysis, we also estimated every outcome at follow-up as a function of self-reported frequency of exposure to Tips advertisements, measured as an index of exposure. These models also controlled for the baseline value of the outcome, so the estimated association between outcome and exposure reflected the effect for individuals who were equal in the precampaign status of the outcome. We weighted all survey estimates to reflect US census demographics. Absolute numbers of participants and percentages shown are weighted totals and proportions, respectively. We did all analyses with Stata, version 12.

Although our study was not powered to detect effects among subgroups, we did exploratory analyses of interaction effects and stratified models to assess possibilities for moderation of campaign effects by ethnic origin, education, age, and cigarette consumption. Because less than 0.5% of the sample had missing observations on any outcomes, we excluded participants with missing data from our models, rather than imputing missing data values. We did several model diagnostic analyses, which indicated that our models fit the data adequately with minimum evidence of variance inflation or multicollinearity.

We applied rates of change in the KnowledgePanel cohort before and after the Tips campaign, and national smoker prevalence data from the 2012 National Health Interview Survey, to US census data to derive the total estimated number of smokers nationally making a quit attempt as a result of the Tips campaign. We estimated the national number of smokers who were not smoking at the end of the campaign by applying the prevalence for abstinence in the KnowledgePanel cohort to the total estimated number of smokers who made a quit attempt nationally. Similar population estimates were calculated for every non-smoker outcome.

**Role of the funding source**
Staff from CDC’s Office of Smoking and Health had no role in data collection. CDC staff contributed to design of

<table>
<thead>
<tr>
<th>Before Tips campaign</th>
<th>During Tips campaign</th>
<th>After Tips campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of adults recorded in the 2011 population census (age ≥18 years)</td>
<td>..</td>
<td>237 657 645</td>
</tr>
<tr>
<td>Total number of smokers in the 2012 population census (age ≥18 years)</td>
<td>..</td>
<td>43 700 000 (18.4%)</td>
</tr>
<tr>
<td>Prevalence of quit attempts in past 3 months (in cohort)</td>
<td>31.1% (30.3-31.9)</td>
<td>..</td>
</tr>
<tr>
<td>Estimated number of smokers reporting a quit attempt in past 3 months</td>
<td>13 600 000 (13 300 000-13 900 000)</td>
<td>..</td>
</tr>
<tr>
<td>Estimated number of additional smokers who made a quit attempt</td>
<td>..</td>
<td>1 640 000 (1 620 000-1 660 000)</td>
</tr>
<tr>
<td>Estimated number of smokers abstinence</td>
<td>..</td>
<td>..</td>
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</tbody>
</table>

Data are number of people or prevalence (95% CI). Model sample size is 5899 (2950 unique individuals). *Based on point prevalence of abstinence, defined as those who report at follow-up both non-smoker status and smoking no cigarettes a day.

**Table 2: Quit attempts among smokers before, during, and after the Tips campaign**

<table>
<thead>
<tr>
<th>Before Tips campaign</th>
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<th>After Tips campaign</th>
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<tbody>
<tr>
<td>Number of adults recorded in the 2011 population census (age ≥18 years)</td>
<td>..</td>
<td>237 657 645</td>
</tr>
<tr>
<td>Total number of non-smokers in the 2012 population census (age ≥18 years)</td>
<td>..</td>
<td>193 900 000 (81.6%)</td>
</tr>
<tr>
<td>Prevalence of any talking to a family member or friend about the dangers of smoking (in cohort)</td>
<td>34.9% (34.3-35.5)</td>
<td>..</td>
</tr>
<tr>
<td>Estimated number of non-smokers who talked to a family member or friend about the dangers of smoking</td>
<td>61 900 000 (60 700 000-63 100 000)</td>
<td>..</td>
</tr>
<tr>
<td>Estimated number of additional non-smokers who talked to a family member or friend about the dangers of smoking</td>
<td>..</td>
<td>6 450 000 (6 400 000-6 500 000)</td>
</tr>
<tr>
<td>Prevalence of any recommendation of telephone helpline or website to a friend or family member (in cohort)</td>
<td>2.6% (2.3-2.9)</td>
<td>..</td>
</tr>
<tr>
<td>Estimated number of non-smokers who made any recommendation of telephone helpline or website to a friend or family member</td>
<td>5 100 000 (4 480 000-5 640 000)</td>
<td>..</td>
</tr>
<tr>
<td>Estimated number of additional non-smokers who made any recommendation of telephone helpline or website to a friend or family member</td>
<td>..</td>
<td>4 760 000 (4 500 000-4 960 000)</td>
</tr>
</tbody>
</table>

Data are number of people or prevalence (95% CI). Model sample size is 4310 (2155 unique individuals).

**Table 3: Communication about the dangers of smoking and recommendation of cessation services by non-smokers before, during, and after the Tips campaign**
the study, data analysis, data interpretation, and writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

4108 (70%) of 5903 invited smokers and 3000 (58%) of 5203 invited non-smokers completed the baseline survey. At follow-up, 3051 (74%) of 4108 smokers and 2220 (74%) of 3000 non-smokers completed the survey. In the unweighted sample, slightly fewer younger smokers (age 18–24 years) and slightly more older smokers (age ≥55 years) were noted at follow-up, compared with baseline (table 1). Moreover, fewer smokers with children in the household and fewer Hispanic non-smokers completed follow-up, compared with baseline. No other characteristics differed between baseline and follow-up surveys among smokers, and none were different in non-smokers (appendix, p 7).

Overall, 2395 (78%) smokers and 1632 (74%) non-smokers recalled seeing at least one Tips advertisement on television. Of smokers, 519 (17%) reported hearing Tips advertisements on the radio, 204 (7%) saw them on billboards, 171 (6%) viewed them via the internet (online banners or displays), and 238 (8%) read print advertisements. 702 (23%) smokers saw or heard a Tips advertisement via a medium other than television.

The prevalence of smokers reporting a quit attempt for 1 day or longer in the past 3 months increased from 31·1% (95% CI 30·3–31·9) before the Tips campaign began to 34·8% (34·0–35·7) after it ended (table 2), a relative increase of 12% (adjusted odds ratio 1·20, 95% CI 1·02–1·40; p=0·02; appendix, p 8). Of smokers reporting a quit attempt during the campaign, the prevalence of abstinence at follow-up was 13·4% (95% CI 9·7–17·2). Analytical models based on self-reported exposure frequency yielded nearly identical results for quit attempts, with an adjusted odds ratio of 1·18 (95% CI 1·05–1·34; p=0·01; appendix, p 9).

Among non-smokers, the proportion talking with family or friends about the dangers of smoking rose from 31·9% (95% CI 31·3–32·5) before the Tips campaign began to 35·2% (34·6–35·9) after it ended (table 3), a relative increase of 10% (adjusted odds ratio 1·23; p=0·02) compared with heavy smokers (1·08; p=0·05–0·65) and among smokers with less education history (1·31; p=0·02) versus those with at least some college education (1·08; p=0·04). Furthermore, younger smokers showed greater changes in quit attempts (1·31; p=0·02) compared with older smokers (1·08; p=0·04), similar to findings in African-American smokers (1·61; p=0·04) versus white smokers (1·23; p=0·01).

Discussion

The Tips campaign was the first, national, mass-media antismoking initiative to be funded by the US Government. It reached nearly 80% of US smokers and was associated with a 12% relative increase in quit attempts within a nationally representative cohort. Based on the absolute increase in quit attempts of 3·7%, the public health effect of Tips was substantial, with an estimated 1·64 million quit attempts made and 220 000 smokers abstinent at the campaign’s culmination. Millions of non-smokers reported talking to smokers during the Tips campaign about the dangers of smoking, with many referring friends and family to cessation services. Our results show the effectiveness and public health outcomes of a national campaign using hard-hitting messages delivered in emotional, graphic personal stories.

Use of cessation services, including calls made to the telephone helpline and visits to the quit website, escalated during the campaign period, supporting our estimated rise in national campaign-related quit attempts. Calls to 1-800-QUIT-NOW increased 132% during the period of the Tips campaign, representing more than 200 000 additional calls compared with the same period in the previous year, and more than 500 000 unique visitors above baseline rates accessed www.smokefree.gov during the campaign. Therefore, 1·64 million quit attempts during the Tips campaign might be an underestimate because only a few people who make quit attempts seek help. Furthermore, during our assessment we only looked at immediate campaign effects, and some smokers motivated to quit by Tips advertisements might have stopped smoking after follow-up.

About half to three-quarters of smokers who attempt to quit relapse within 1 week. Taking the 220 000 smokers who remained abstinent at follow-up, and eliminating a proportion who possibly quit during the final week of the campaign (about a twelfth), we estimate conservatively that half (at least 100 000) would not relapse in the future. Thus, of the 1·6 million additional smokers who made
quit attempts because of the Tips campaign, we anticipate that at least 100 000 (6·1%) sustained their cigarette abstinence long term.

Preliminary calculations also suggest a favourable return on investment from the Tips campaign, augmenting previous cost-effectiveness findings for a non-federal media campaign.20 By application of the age-distribution of adults who made quit attempts as a result of Tips advertising exposure to recent calculations of life-years saved by age at cessation for US adults,3 we estimate that the sustained attempts to quit as a result of Tips added from a third to almost half a million quality-adjusted life-years to the US population. This approximation is conservative because we only included life-years saved before age 65 years. In view of the $54 million campaign development, implementation, and evaluation costs, this estimate suggests a campaign-related cost per life-year saved of less than $200 before discounting, ranking Tips among the most cost-effective preventive interventions.8 CDC’s investment in this campaign represents less than the cost of 3 days of the $8 billion the tobacco industry spends annually on promotion and marketing.

The Tips campaign seems to have resulted in millions of non-smokers talking to smokers about quitting and getting help. Particularly in countries such as China, India, Bangladesh, Egypt, Malaysia, Indonesia, and Russia, where far fewer former smokers live and that have lower annual rates of quit attempts, influencing the non-smoker population could help to change social norms about the acceptability of smoking and the importance of quitting. Other programmes outside the USA have made efforts to target these so-called social influence outcomes, but previous evidence for the effects of such initiatives on non-smoker behaviour is limited.18

Analysis of interaction effects did not yield definitive evidence of any differences within smoker subgroups of changes in quit attempts before and after the Tips campaign. However, our stratified analysis suggested augmented effects among light smokers, those who had less education, were young, or of African-American origin, findings that accord with previous research.10-13 In view of the small size of our subgroup samples, further work is needed to fully ascertain differential campaign effects among these groups. However, our results are promising for mass-media campaigns similar to Tips to address health equity and the important challenge of motivating light smokers to quit.

Strengths of our study include a rigorous campaign development process, use of nationally representative samples of smokers and non-smokers followed up prospectively with fairly high completion rates, an intervention targeted at the entire adult US population, and outcomes with clinical relevance (quit attempts and abstinence at follow-up). Additionally, we controlled for multiple factors associated with attempts to quit12 and included rapid intervention and follow-up phases, thus decreasing the probability of temporal trends affecting the quit-attempt rate.

Our assessment has several limitations. First, use of an online panel cohort might limit generalisability of our national estimates, because systematic differences might exist between individuals who choose to join an ongoing internet panel and those who do not wish to participate. However, we used address-based sampling with weighting to US census demographic frequencies, and KnowledgePanel has been used in other studies requiring national data,14 including media evaluation,15 and is comparable with random-digit-dial phone surveys.16 Second, our estimates for probable sustained abstinence were calculated from the prevalence of abstinence at follow-up after the campaign ended, because extension of follow-up and increasing the sample size of the cohort study to enable assessment of sustained abstinence was prohibitively expensive and unfeasible. However, studies of relapse-curve patterns show strong predictable correlations between the prevalence of abstinence and sustained abstinence after the first week.17 Our 6·1% estimate of sustained abstinence resulting from quit attempts made during the Tips campaign is similar to rates reported in the scientific literature. For example, in a meta-analysis of large community-based trials of telephone helplines, smokers who were randomly allocated no counselling or medication services had a 6-month quit rate of 8-5%.4 In 2010, findings of the National Health Interview Survey showed that 52-4% of all smokers made at least one quit attempt the previous year and 6-2% quit successfully for 6 months or longer when surveyed.7 In a population-based study,7 smokers who recalled making any quit attempt in the past year made nearly 1·8 quit attempts a year, a rate that yields a success rate per individual quit attempt of 6-6%, which is similar to our 6-1% estimate.

Estimates of successful attempts to quit smoking without assistance are based on starting from the beginning of the quit attempt, reinforcing that our estimate is conservative since only a few of our postcampaign respondents would have quit on the day they were surveyed. The number of days since last cigarette might be a better measure for assessment of quit success and could enhance the precision of relapse survival-curve calculation. An implicit assumption in our projection of quit success is that the rate of success is similar for smokers motivated to quit by the Tips campaign and those who tried to quit despite the campaign. This assumption is probably conservative, because smokers motivated to quit by the Tips campaign might have had increased motivation and obtained extra help compared with smokers who tried to quit alone. Also, we did not gather information about the use of other tobacco products, which might be of interest in future studies, to ascertain if the benefits of cigarette cessation might be mitigated by substitution of other products in some smokers attempting to quit.
In view of the national coverage of the Tips campaign, another limitation of our study is that a non-exposed control study or a randomised controlled trial was not possible. However, assessment of real-world effects at the national scale is not necessarily best undertaken via randomisation. Nonetheless, inferences about the causal effect of the campaign assume no other temporal differences between baseline and follow-up surveys. We did a LexisNexis search of broadcast news transcripts and news print articles with terms including “antismoking and media”, “tobacco cessation,” “tobacco prevention,” and “tobacco policy” for the period January, 2012, to June, 2012, and reviewed 1044 search results. We found no evidence of other large-scale media campaigns, interventions, or policy changes likely to produce a national effect leading up to or during the Tips campaign. Seasonal trends in quit attempts are usually smaller than the effect we observed,13 and because our 3-month baseline period included the New Year resolution season, any seasonal effects would have probably seen a trend in the opposite direction. Furthermore, we included variables for state-level cigarette taxes and tobacco prevention funding to control for these known influences on societal smoking. As with any study examining temporal changes in a population, the possibility exists that an unknown factor, other than the Tips campaign, might have affected the quit-attempt rate. However, the likelihood of a causal relation between the increase in quit attempts and the Tips campaign is reinforced by the non-temporal finding that people who reported follow-up having seen the Tips advertisements were more likely to report making a quit attempt, with an odds ratio increase nearly identical to that noted in the temporal trend analysis (appendix, p 9). The likelihood of a causal relation is also reinforced by the size of the change in quit-attempt rate over a 3-month period, which was significant and took place during a historical period in the USA, when quarterly quit rates had been flat for 3 years (appendix, p 13).11–16

Only current smokers were included in the smoker cohort, because we could not track changes in quit attempts by people who had recently become non-smokers. This limitation meant we did not include in our analysis former smokers who quit during the 3 months before the Tips campaign. Future interventional cohort studies might benefit from establishing a cohort of current and former smokers and measuring intervention effects on both quit attempts among current smokers and continued cigarette abstinence among recent former smokers.

Our study is one of the first to assess the effect of a large, branded, national antismoking campaign on quit attempts using a prospective cohort. To date, most evidence on the effectiveness of US antismoking campaigns has been restricted to state or regional programmes. Globally, most assessments of national campaigns outside the USA have featured one or more of the following characteristics (panel): reliance on regional data, cross-sectional comparisons at precampaign and postcampaign surveys, self-reported advertisement exposure, or surrogate markers for population quit-attempt rates (such as the number of calls to a telephone quit helpline).10,16,17 Hence, our study provides important evidence that national antismoking campaigns can generate population-level public health effects.

Although the Tips campaign had a short-term effect on attempts to quit smoking, declines in mass-media campaign effects after the conclusion of a time-limited

Panel: Research in context

Systematic review

We selected context studies through a systematic automated PubMed search followed by qualitative assessment of relevance based on predefined criteria. We designed the automated search to capture studies related to adult-focused cessation media campaigns, and this search yielded 351 discrete studies. We retained studies if they reported results for at least one of the following outcomes: 1) campaign awareness; 2) quit attempts or intention to quit; 3) sustained abstinence or relapse; 4) discussions about a campaign; 5) friends’ recommendation to quit or seek cessation services; 6) calls to a quit helpline; 7) website visits; or 8) cost effectiveness. We excluded studies if they: 1) did not include results for adults age 18 and older; 2) assessed a campaign that relied mainly on print media; or 3) had weak methodology or non-generalisable findings. Methodology was judged weak if survey data were gathered by non-random methods, if “quit attempt” was defined as lasting less than 1 day, or if the sample size was fewer than 35. Findings were deemed not generalisable if the sample was not representative of either adult smokers or a substantial subpopulation of adult smokers within the study country.

Evidence for our report is based on a total of 72 studies meeting these criteria, including 11 non-peer-reviewed reports published by federal health agencies and not indexed in PubMed. Outcomes from all studies were compared and synthesised.

Interpretation

Our report expands on previous work reporting on the effectiveness of mass-media campaigns. However, our study seems to be the first, prospective cohort-based assessment of a national campaign that directly links campaign exposure to behavioural outcomes for smokers and non-smokers. Although media campaigns have been done at country level (eg, in Thailand, Australia, the UK, and Canada), ours is the first evaluation of a national, adult-focused media campaign done in a very large country (population more than 150 million). Our findings provide solid evidence—particularly for very large countries such as India, China, Indonesia, Bangladesh, Pakistan, Nigeria, Brazil and Russia—that media campaigns are scalable to the national level, even when delivered across diverse geographic and political units. This study is also one of the first to investigate short-term effects of a brief campaign, showing that immediate measureable effects can be created. Our examination of the increase in recommendations by non-smokers for smokers to quit is a unique contribution of particular relevance to large countries where rates of quit attempts are low and mobilisation of non-smokers might have an effect on social norms around quitting. By undertaking a campaign carefully developed on the basis of a country’s experience and intensive formative research, and using a prospective longitudinal cohort design with 7000 smokers and non-smokers, our findings will help to ensure that large countries take seriously the potential of mass-media campaigns enumerated over the past two decades in smaller geographical units. We further this goal by extending the results of our study to census data, to generate national estimates of quit attempts and implications for total population long-term cessation and years of life saved, which will help policy makers understand the implications of the results.
Articles

programme have been recorded. In Australia, findings of a 6-year population-based cohort study suggested that repeated cycles of tobacco-control media campaigns are necessary to sustain high levels of quit attempts. To maintain the effect of Tips, the CDC broadcast a sequel campaign between March, 2013, and June, 2013, that included new advertisements featuring additional conditions such as adult asthma from secondhand smoke, chronic obstructive pulmonary disease, and lung cancer. Furthermore, the US Food and Drug Administration will launch media campaigns in 2014 targeting children aged 12 years and older and young adults.

Ending the tobacco epidemic could save millions of premature deaths and curb health-care costs worldwide. For us to see pronounced reductions in smoking prevalence, renewed efforts will be needed by clinicians and the public health community. Ongoing mass-media campaigns can support the role of clinicians by increasing patients’ interest in quitting. The Tips campaign seems to have helped more than 100,000 smokers to quit, but sustaining progress in tobacco control will require persistent hard-hitting advertisements, effective policy and regulatory interventions, and health-care leadership to help millions of smokers live longer healthier lives. Implementation of similar hard-hitting campaigns in other countries could accelerate progress on the WHO Framework Convention on Tobacco Control and reduce smoking prevalence globally.

Contributors

All authors were involved in study design, analysis of data, development of tables, data interpretation, and writing of the report. The corresponding author had final responsibility for the decision to submit for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

Acknowledgments

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29 Villanti AC, Curry LE, Richardson A, Vallone DM, Holigrae DR. Analysis of media campaign promoting smoking cessation suggests it was cost-effective in prompting quit attempts. Health Aff (Millwood) 2012; 31: 2708–16.
Effects of a short-term mass-media campaign against smoking

Although the benefits of continuous antismoking media campaigns are clear, little is known about the effects of short-term programmes on attempts to quit smoking by the general population. In The Lancet, Timothy McAfee and colleagues’ report on a national antismoking campaign funded by the US Centers for Disease Control and Prevention, called “Tips from Former Smokers” (Tips), which was delivered via television, print, digital, and other media outlets for 3 months. Development of advertisements for the Tips campaign was rigorous and considered a diverse set of smokers’ opinions about what would help them quit. Hard-hitting, emotional, and graphic real-life stories were produced that emphasised the effects of smoking-related disease on quality of life, rather than focusing on risk of death.

The effectiveness of this public-health education programme was assessed by baseline and follow-up surveys of a nationally representative sample of 3051 adult smokers and 2220 non-smokers. The prevalence of smokers reporting a quit attempt rose over the period of the campaign (adjusted odds ratio 1·20, 95% CI 1·02–1·40; p=0·02). McAfee and colleagues estimated that, nationwide, 1·64 million additional smokers made a quit attempt during the 3-month Tips campaign, and 220 000 (95% CI 159 000–282 000) remained abstinent at follow-up. Furthermore, 4·7 million additional non-smokers recommended a cessation service (telephone helpline or quit assistance website) and more than 6 million discussed the hazards of smoking with family and friends. These study findings could be deemed population-specific, but they should nonetheless encourage low-income and middle-income countries—such as China, India, Bangladesh, Egypt, Malaysia, Indonesia, and Russia—to develop appropriate and cost-effective strategies for tobacco control.

Tobacco dependence has been defined as a chronic disease, and the process of quitting smoking is dynamic; therefore, a prolonged campaign might have had a greater effect. Globally, many long-term antismoking programmes have been delivered. However, Tips was the first federally funded, high-exposure, national antismoking media campaign in the USA, and it reached almost 80% of the US population.
Ministry of Health, in which the evidence for health hazards of smoking and exposure to secondhand smoke and other aspects related to tobacco were described. On Aug 14, 2013, core messages of health education on tobacco control derived from this report were released by the Chinese Government. A national mass-media campaign has been recognised as one of the most important strategies for tobacco control in China and would be ideal to drive changes from knowledge and belief to action.

The Tips campaign cost US$54 million, which is around 0.7% of the total annual expenditure by tobacco companies on cigarette advertising and promotional activities in the USA. In China, all tobacco companies are state-owned; in 2012, around $137·6 billion in tobacco tax revenue passed to the Chinese Government. The most effective measure would be to increase tobacco taxation substantially—triple the price, halve consumption, and double the tax yield—as French experience suggests. If a small proportion of this income could be allocated by the government for tobacco control, various effective tobacco-control measures could be implemented in China. Such interventions would save millions of lives and substantially cut health-care expenses for tobacco-related diseases.

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