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TITLE: Effectiveness of a French mass media campaign in raising knowledge of both long-term alcohol-related harms and low-risk drinking guidelines, and in lowering alcohol consumption

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Findings: In T1, we observed significant positive interactions between exposure group based

ABSTRACT

Aims: To evaluate the effectiveness of a French mass media campaign in raising knowledge of both long-term alcohol-related harms (LTH) and low-risk drinking guidelines (LRDG), as well as in lowering alcohol consumption.

Design: An 8-month longitudinal survey from February to October 2019, with three waves of online data collection (T0 before the campaign, T1 just after it ended, and T2 6 months after it ended).

Outcomes variables: Knowledge of LTH, knowledge of LRDG, or of cancer risk. At T2, no significant interaction was observed for the main guideline; or of cancer risk. At T2, no significant interaction was observed for the main guideline; or of cancer risk.

Setting: France

Participants: 2,538 adult drinkers (18-75 years old)

Measurements: The main outcomes' variables were LTH knowledge (cancer, hypertension, brain haemorrhage), LRDG knowledge (two guidelines: 'maximum of 2 drinks a day' and 'minimum of 2 days without alcohol per week'), intention to reduce alcohol consumption, and self-declared consumption with respect to the French LRDG. At T1, exposure to the campaign was measured using self-reported campaign recall.

Conclusions: There appears to be an association between exposure to a 2019 French mass-media campaign to raise knowledge of long-term alcohol-related harms and low-risk drinking guidelines (LRDG) and reduce alcohol consumption and i) improved knowledge of the 'maximum 2 drinks per day guideline', ii) knowledge of the risks of hypertension and brain haemorrhage, and iii) a reduction in the proportion of people exceeding LRDG (in the general population only). These associations were only observed over the short term and, in some cases, only for certain segments of the population.

KEY WORDS: alcohol, media campaign, prevention, social marketing, evaluation, effectiveness, low-risk drinking guidelines, alcohol-related risks, long-term alcohol-related harms, knowledge

INTRODUCTION

The most recent evidence suggests that alcohol consumption, even at low levels, is a major risk factor for premature mortality and disability worldwide (1-4). Health authorities in several countries have established specific alcohol drinking levels to limit health risks (5). In France, an expert group was mandated by public health authorities in 2017 to establish new, evidence-based, low-risk drinking guidelines (LRDG). The resulting guidelines recommended that adult men and women should not consume more than 10 standard alcohol drinks per week (one standard drink equals 10g of pure alcohol), no more than two standard drinks per day, and that people should have alcohol-free days every week (resulting in a minimum of two alcohol-free days) (6).

In the same year (2017), a national survey conducted on a representative sample of the French population highlighted that almost 25% of 18-75 year olds consumed alcohol beyond these guidelines (7). In this context, *Santé publique France*, the National Public Health Agency, launched a national campaign in 2019 to raise knowledge of both the long-term alcohol-related harms (LTH) and the new LRDG, in order to reduce alcohol consumption in the French population.

Between 2006 and 2014, only 10% of alcohol harm prevention campaigns worldwide focused on informing people about LTH, a minority of which included LRDG (8). If research has revealed that mass media health campaigns can increase public knowledge about alcohol and change attitudes toward it (9), a systematic review found less evidence for their effectiveness in reducing alcohol consumption (10). Theoretical models like the COM-B model explain it because informing people is not enough to change their behaviour (11). An Australian experimental study showed that drinkers - whether at risk of alcohol-related harms or not - judged that the most motivating types of campaign to reduce their consumption were LTH campaigns that included guidelines and were aimed at the general public (12). Other experimental studies also highlighted that campaigns combining LTH messages and LRDG generate more accurate estimations of harmful drinking levels, increase negative attitudes toward alcohol, strengthen drinkers' intention to drink less, and increase compliance with guidelines (13, 14). Therefore, it seems useful to use longitudinal studies to confirm whether the effects observed under experimental conditions in these recent studies are also visible in the real-world context of a general population campaign.

In this context, the present study aimed to show the effectiveness of this first French campaign on the knowledge of LTH and of LRDG, as well as on alcohol consumption in the general French population. We also analysed the effectiveness of the campaign according to consumers' profiles (i.e. sex, age and education).

METHOD

Description of the '*Ravages*' French campaign

A one-month multi-media national campaign, named *Ravages*, was launched on 26 March 2019 by Santé Publique France. It mainly consisted in a TV ad (a 30-second video, available at https://www.youtube.com/watch?v=Xo0x_85pERo) shown on popular television channels and on online video (OV) including on social media (Youtube, Facebook and Instagram). The spot showed characters in different life situations which were described by a voice over saying: "This is an ad against the ravages of alcohol; there is no car accident, no guy crawling home, no one waking up next to a dark stranger. And there's not even a fight outside a bar". Then, one of the characters in the spot suddenly gets dizzy and has to go to hospital. The voice over says "It doesn't have to come to this for alcohol to take its toll: beyond 2 drinks a day you increase your risk of a brain haemorrhage, cancer and hypertension". The spot ends with the campaign slogan: "For your health, no more than 2 alcohol drinks per day. And not every day", followed by the name of the national support website alcool-info-service.fr.

In addition to the TV campaign, digital ads were broadcast online, and three short interviews (60 seconds) between experts (physicians, addictologists) and a journalist talking about LTH were broadcast on national radio stations. In addition, posters were placed in medical venues (see appendix). These were sent to general practitioners one month prior to the campaign. Finally, educational videos on LTH and LRDG were broadcast on screens in different health facilities.

The campaign addressed the general population: the mass media (TV, radio) and the contents of messages could reach a very large audience. In order to rationalize media investments and messages, but knowing that it would eventually spread to a larger group, 25-49 year olds were defined as the core media target group (22% exceeded LRDG). Among them, the campaign's Gross Rating Points (GRPs) for TV/OV were 516 and 330 for radio. GRPs are a measure of the percentage of the target audience exposed at least once to the campaign, multiplied by the average number of exposures to the campaign (15). In our case, 88% of people aged 25-49 were exposed to the video on TV and saw it 5,8 times on average; the coverage was 46% and repetition 7,2 for radio (16).

Study design and sample

An eight-month longitudinal survey was implemented from February to October 2019 to assess the effectiveness of the campaign. A sample of 4,002 alcohol drinkers aged 18 to 75 years old was recruited from an access panel by the French market research company BVA to be surveyed online. The study was presented as being conducted by BVA to better understand the behaviours of French people. The screening question and answer modalities were adapted from the AUDIT-C test (17) as follows: "During the past 12 months, how often have you drunk alcoholic beverages, whether beer, wine, cider, spirits, champagne, or any other type of alcohol drink, including drinks low in alcohol?"; "every day", "four times a week or more", "two to three times a week", "two to three times a month", "less often", and "never". Respondents who replied "never" were excluded from the study.

At T1, a new sample of 501 alcohol drinkers was included, following the same quota structure

We used quota sampling to select the study sample using the characteristics of drinkers in differences were observed between the two samples at T1, then such an effect existed. terms of sex, age, socio-professional category, size of urban area, and region, which were observed in the 2017 French national health survey which was representative of the general population (18). Respondents were first surveyed before the media campaign (T0, February 22 - March 18). All were contacted again just after the end of the campaign (T1, April 17 - May 12), and respondents to T1 were contacted again six months later (T2, September 25 – October 15) (Figure 1).

Of the 4,002 alcohol drinkers surveyed online at T0, 3,005 (75.1%) responded at T1. Of these, 2,538 were surveyed at T2 (63.4% of initial respondents) and were included in the present analysis (i.e., study sample). A higher proportion of females than males were lost to follow-up (38.4% vs 34.8%, $p=0.018$). The same was true for high-school graduates (39.2% lost to follow-up vs 37.7% of individuals with less than a high-school diploma, and 34.6% of third-level graduates, $p=0.033$). The attrition rate decreased with age (50.2% in 18-34 year olds, 36.0% in the 35-49 year old group, 31.0% in 50-64 year olds, and 24.6% in those aged 65 and older, $p<0.001$). Attrition did not differ by size of urban area of residence, level of alcohol use at T0, or intention at T0 to reduce alcohol use in the next 30 days.

The study was conducted in accordance with the guidelines of the French commission on data privacy and public liberties (CNIL). The primary research question and analysis plan were not pre-registered, so the results should be considered exploratory.

Measures

The aim of the longitudinal survey was to assess the association between exposure to the campaign, and the evolution of participants' knowledge of LTH, knowledge of LRDG, intention to reduce alcohol consumption, and level of alcohol consumption with respect to LRDG.

Assisted recall (exposure)

Exposure to the campaign was measured using self-reported and assisted campaign recall (19), which was recorded at T1 as follows: participants were consecutively shown - in a random order – the campaign's TV and radio spots, digital banners, educational videos and posters in medical venues. The following questionnaire item was shown for each campaign item: "*Here is a [specific content] broadcast on [television, the internet, radio and/or health facility]. Please indicate whether you remember having seen or heard it.*" Respondents who reported they had seen or heard at least one of these campaign items were considered to have recalled the campaign (exposed group).

Outcomes

Knowledge and perceived susceptibility LRDG knowledge was measured using two open-ended questions, “In your opinion, to limit health risks, how many alcoholic drinks per day should you not exceed?” and “In your opinion, to limit health risks, how many days in the week should you avoid drinking alcohol?”. Respondents who answered “2 drinks per day” and/or “2 days without drinking in a week” were considered to have answered the questions correctly.

Knowledge of the risk of developing the three diseases presented in the campaign (cancer, hypertension, and brain haemorrhage) from drinking alcohol was also measured using the questions: “In your opinion, does drinking alcohol present a risk of... cancer? hypertension? brain haemorrhage?” with yes/no answers.

Alcohol-related LTH awareness was assessed using the item “Alcohol consumption involves long-term health risks” with a four-point Likert response scale: strongly agree, somewhat agree, somewhat disagree, strongly disagree. This variable was dichotomized into ‘strongly agree’ and ‘all other responses’.

Respondents were also asked to evaluate the risk associated with their own alcohol consumption (their perceived susceptibility) with the following question: “In your opinion, does your current alcohol consumption present a long-term health risk?”, with the possible response modalities “yes, definitely” and “yes, probably” being pooled for results, and “no, probably not” and “no, definitely not” also being pooled.

Alcohol consumption. Intention to reduce alcohol consumption was collected using the question: “In the next 30 days, do you intend to reduce your alcohol consumption?” with the response modalities “yes, definitely” and “yes, probably” pooled for results, and “no, probably not” and “no, definitely not” also pooled.

Two questions collected data on whether participants’ had thought about their drinking and about their desire to drink less: “In the past 30 days, have you thought about your alcohol drinking?”, and “Do you want to reduce your alcohol drinking?”. Answer modalities were ‘yes’ and ‘no’. We hypothesized that these variables might be related to both campaign recall and changes in our outcomes.

Finally, respondents reported their alcohol consumption by indicating in a table the number of standard glasses of alcohol they had drunk in the previous seven days (the calendar days were written in the table). The table listed the following types of alcoholic drinks: beer, wine, cider, spirits, champagne, and any other type of alcohol drink, even low in alcohol. The standard doses validated in France were indicated on a diagram (1 glass of alcohol = 10g of pure alcohol = 10cl of wine = 25cl of beer = 2.5cl of whisky, etc.). Based on the LRDG,

participants who reported drinking more than a total of 10 standard drinks, or drinking more than 2 drinks in any day, or having drunk alcohol in more than 5 of the previous seven days were defined as having a risky drinking profile. Participants who did not meet these criteria were defined as having a low-risk drinking profile.

All study outcomes were collected at each survey wave (T0, T1, and T2).

Covariates: Socio-demographic variables

Covariates included socio-demographic variables based on their relation with alcohol drinking behaviours, collected at T0: sex, age, education level and socio-professional category. Education level was defined as the highest educational diploma obtained (categorized into less than upper secondary school certificate, upper secondary school certificate, and third-level qualification). The interviewee's socio-professional situation was categorized according to the French National Institute for Statistics and Economic Studies (INSEE) socio-professional classification as follows: 1) independent workers (including farmers, craftspeople, retailers, and business owners); 2) managers, senior-level professional occupations; 3) professional workers; 4) clerical workers; 5) manual workers; 6) inactive persons. Categories 1 to 3 were grouped together under 'high socio-professional category', while categories 4 and 5 were grouped under 'low socio-professional category'. Retired respondents were coded under their last socio-professional category. The size of urban area of residence was coded from the postal code indicatedidence, using data from INSEE.

Statistical analyses

Post-stratification weights (raking ratio) were computed by BVA to reflect the alcohol drinking population's structure in terms of sex, age, region, size of urban area of residence, and socio-professional category. They ranged from 0.67 to 2.39 and were used for bivariate analyses only.

Sociodemographic characteristics and alcohol use (exceeding or not exceeding the LRDG) at T0, desire to reduce alcohol consumption at T0, and thinking about one's drinking in the previous 30 days in T0, were compared between respondents who recognized at least one campaign element at T1 (the 'exposed' group, n=1,898) and those who did not recognize any (the 'unexposed' group, n=640).

Bivariate analyses were performed to present the evolution of outcomes at each wave, according to exposure group.

To test whether patterns of changes in outcomes differed according to exposure group, Generalised Estimating Equation (GEE) models (20, 21) predicting each outcome were computed using binomial distribution, the logit link function, unstructured correlation, and robust variance estimates. These models were adjusted for sociodemographic (sex, age, size of urban area, education level, socio-professional category) and alcohol-related (alcohol use, desire to reduce consumption, thinking about one's drinking) covariates reported at baseline that were significantly associated with self-reported exposure to the campaign ($p < 0.05$). In

addition to main effects of exposure group and wave variables, the inclusion of exposure group X wave interaction allowed us to test whether the change in outcomes between waves significantly differed according to exposure group. Adjusted odds-ratios (aOR) for this interaction corresponded to the additional changes in outcomes between waves in the exposed group compared with the non-exposed group. Third order interactions with sex, age (18-49 years-old, ≥ 50 years-old), level of education and socio-professional category were added in separate models to test differences in effect. aOR for each subgroup are shown in the text below when differences were observed.

In sensitivity analyses, the GEE models were computed on 'at-risk drinkers at T0' (n=969) (i.e. people exceeding LRDG, which are a major group of interest for the campaign) for all outcomes except alcohol use. For the latter, two separate multivariate logistic regressions at T1 and T2 were conducted, with the same adjustment variables.

The distribution of the variables of interest at T1 was compared between the main sample and the control sample (i.e., the 501 new respondents included at T1) using Student tests. Few differences were observed (see supplementary table S1) suggesting a limited repeated questionnaire effect.

The statistical package Stata/SE 14.2 was used for all analyses.

RESULTS

Sample characteristics

The characteristics of the sample in terms of sociodemographic characteristics, alcohol use and related perceptions at T0 are shown in Table 1, both overall and separately according to self-reported exposure to the campaign.

Regarding the assisted recall of the campaign (i.e., the exposure variable), 74.5% of the included individuals said they recognized at least one element of the campaign (67% recognized the TV spot). There was no significant difference between the exposed and non-exposed groups regarding sex, size of urban area of residence, or socio-professional category. However, respondents who recalled the campaign were older than those who did not (74.5% of exposed respondents were over 35 years old vs 67.7% of non-exposed respondents, $p=0.007$) and were less educated (27.7% had less than an upper secondary school certificate vs 21.7%, respectively, $p=0.002$). At T0, exposed respondents were slightly more likely to report thinking about their drinking in the previous 30 days (16.0% vs 12.4%, $p=0.038$), and to report a desire to reduce their alcohol consumption (22.7% vs 18.8%, $p=0.044$). There was no difference between the two groups in terms of risky drinking at T0 (38.3% of the overall sample had alcohol consumption exceeding the LRDG).

Effect of exposure to the campaign

The evolution of outcomes at each survey wave in both exposure groups is shown in Table 2.

Campaign effect on LRDG knowledge and LTH knowledge

With regard to the LRDG knowledge, a significant interaction was observed between the survey wave and campaign recall for knowledge of the 'maximum of 2 drinks per day' guideline (overall p-value = 0.026). Specifically, the aOR associated with campaign recall at T1 - which corresponded to the ratio of the change between T0 and T1 in the knowledge of the 'maximum 2 drinks per day' guideline between the exposed and unexposed groups - was 1.32 [1.08-1.62] (p=0.008). In other words, the change between T0 and T1 in the probability of knowing the 'maximum 2 drinks per day' guideline is significantly more favorable in the exposed group than in the unexposed group. At T2, the aOR associated with campaign recall was not significant for this guideline (p=0.461). No significant interaction between survey wave and campaign recall was observed for knowledge of the 'minimum of 2 days a week without alcohol' guideline (Table 3).

With respect to LTH knowledge, a significant interaction between the survey wave and campaign recall was observed. More specifically, an improvement was observed at T1 but not at T2, for knowledge of the risk of alcohol-related hypertension (overall p-value = 0.025 ; aOR (T1) = 1.41 [1.09-1.81], p=0.008 ; aOR (T2) = 1.06 [0.79-1.41], p=0.695), and for knowledge of the risk of alcohol-related cerebral haemorrhage (overall p-value < 0.001 ; aOR (T1) = 1.80 [1.44-2.25], p<0.001 ; aOR (T2) = 1.03 [0.82-1.29], p=0.805). A significant interaction was observed for alcohol-related cancer risk (overall p = 0.007), with no significant odds ratios estimated separately in T1 and T2. A potential repeated questionnaire effect was observed concerning knowledge of the risk of brain haemorrhage. Indeed, at T1, a significant difference was noted between the control sample and the main sample concerning this variable (Table S1).

No significant interaction between survey wave and campaign recall was observed for awareness that alcohol consumption can lead to LTH, nor was there a significant interaction for perceived risk related to one's own drinking (Table 4).

Effect on behaviours and behavioural intentions

No significant interaction between survey wave and campaign recall was observed on intention to reduce alcohol consumption in the next 30 days (Table 4). In contrast, an effect was observed for self-reported behaviours (Table 5). A significant interaction between the survey wave and campaign recall was observed for alcohol consumption with respect to LRDG (overall p-value=0.017). Specifically a lower proportion of at-risk drinkers was observed at T1 in the exposed group than in the unexposed group (aOR = 0.83 [0.69-0.99], p=0.043). This association was not significant at T2 (Table 5).

Effect of campaign exposure according to drinker profile

Effect of the campaign on drinkers who exceeded LRDG at T0

At T1, similar results to general population were observed for consumers who exceeded LRDG at T0 in terms of knowledge of the 'maximum 2 drinks per day' guideline (aOR= 1.60 [1.14-2.25], p=0.007) (see supplementary table S2), and knowledge of LTH for the different diseases investigated (aOR= 1.52 [1.02-2.24], p=0.038, for hypertension; aOR= 1.77 [1.23-2.55],

p<0.001, for cerebral haemorrhage) (Table S3). Furthermore, no significant association between campaign exposure and alcohol consumption with respect to the LRDG was observed in this subpopulation at any point during follow-up (in T1: aOR=0.76 [0.54-1.08], p=0.129; in T2: aOR=1.04 [0.75-1.44], p=0.809) (Table S4).

Effect of the campaign according to sex, age, education level and socio-professional category, in the general population

A three-way interaction between sex, survey wave, and campaign recall in global sample was observed for alcohol consumption with respect to the LRDG (p-value for omnibus test = 0.115). Exposure to the campaign was significantly associated with a decrease in the proportion of at-risk drinkers at T1 in women (aOR=0.67 [0.50-0.88], p=0.004) but not in men (aOR=0.98 [0.76-1.26], p=0.863).

Exposure to the campaign was also associated with improved knowledge of alcohol-related hypertension risk at T1 for 'high' socio-professional categories (aOR=1.90 [1.31-2.75], p=0.001) but not for 'low' socio-professional categories (aOR=1.09 [0.74-1.60], p=0.667), in global sample (p-value for omnibus test = 0.223).

No significant interaction with age or education level was observed.

DISCUSSION

This longitudinal study evaluated the effectiveness of the 2019 French multi-media campaign *Ravages*, which aimed to improve knowledge about alcohol-related LTH and LRDG in the general population in France, as well as to reduce alcohol consumption. It shows that in the general population and in drinkers exceeding LRDG, there was an association between exposure to the campaign and i) improved knowledge of the 'maximum 2 drinks per day guideline', ii) knowledge of the risks of hypertension and brain haemorrhage, and iii) a reduction in the proportion of people exceeding LRDG (in the general population only). These associations were only observed over the short term (between T0 and T1), and in some cases, only for certain segments of the population ('high' socio-professional categories for hypertension risk, and women for reduced consumption).

Other studies, mainly cross-sectional in nature, have shown improved knowledge of LTH associated with alcohol and of LRDG in drinkers exposed to similar prevention campaigns (10, 22, 23). Although a potential reduction in consumption has also been suggested in some experimental studies (13, 14, 24), there was very little evidence for this in real-world conditions (10). Regarding knowledge of risk thresholds, our study showed a link between exposure and improved knowledge of only one French LRDG guideline, namely '2 drinks maximum per day'. It is likely that this result is partly due to the fact that the second part of the French campaign message - 'and not every day' (i.e., do not drink every day) - did not give an explicit indication of the minimum number of days of abstinence to be observed weekly, making it more difficult to appropriate the expert-suggested threshold.

The sensitivity analyses showed that exposure to the campaign among people exceeding LRDG improved LRDG and risk knowledge. This is of particular interest since at-risk drinkers are a crucial group for public health. In general population, our results were not similar for all segments of the population, with the link between exposure to the campaign and knowledge of the risk of hypertension being observed only for individuals in the 'high' socio-professional categories, and a reduction in alcohol consumption being observed only in women (even if no interaction was statistically significant). With respect to gender differences, women are generally likely to drink less alcohol (25) and it could be easier for them to follow LRDG by removing a couple of drinks. Besides, women and men differ in their perceptions of risk (26). Women are generally more concerned by health risks than men and judged potential negative consequences as significantly more severe in health domains (27). An exposure to the Ravages campaign may have increased risk perception among women and then affect their behavioural intentions. The effectiveness of campaigns may also vary by age, and social background (22, 28, 29). With regard to socioeconomic level, the information disseminated in prevention campaigns may be minimized (30, 31) depending on the individual's cultural and social background. For less socially advantaged men - a subpopulation that accounts for a large proportion of drinkers exceeding the LRDG in France - a more affinity-based approach (specific partnerships, medias, etc.) would seem to be necessary to increase the impact of alcohol campaigns (32).

Our study has several limitations that limit the generalization of the results. First, the sample was not totally representative of all drinkers in France insofar as it was non-probabilistic and based on an access p , 38.3% of the sample had an initial consumption exceeding the LRDG vs 27.3% of the general population (7). Second, attrition between the three waves was significant (one third of respondents), but expected for this kind of panel, and was higher for women, 18-34 year olds, students and people with a high-school diploma. This was partly controlled by adjusting for key socio-demographic characteristics. Third, the sample size was likely too limited to fully examine interactions or to measure the possibility of a significant effect of the campaign on alcohol consumption for drinkers exceeding the LRDG. Fourth, the self-reported nature of the study could produce biases, in particular because of social desirability (33). Fifth, changes over time in the unexposed group could be due to external factors (press coverage of the campaign, other concomitant communications) and memory bias. A potential repeated questionnaire effect was also suspected. In addition, filling the survey at T1 exposed people to materials of the campaign. We can hypothesize that being exposed only once could have only a small impact, while people who were exposed to the campaign and/or who recalled it probably had several contacts with it. However, these findings suggest that we might slightly underestimate the effect of the campaign. Finally, we were not able to formally demonstrate the causal nature of the link between exposure to the campaign and changes in the indicators under real-world conditions, as confounding factors may have persisted despite adjusting for variables collected at T0 (such as thinking about one's own drinking and desire to reduce consumption).

The primary strength of this study is that it is longitudinal in nature and has an important sample size. Therefore, changes in knowledge and behaviours related to real-world exposure to the multi-media campaign could be assessed over the short and medium-terms. We found that the positive effects of the campaign were only visible at T1, just after the end of the campaign. This result advocates for continuity in an intense communication about LTH and LRDG, in terms of frequency, duration and media intensity (9, 23, 34).

The present study shows the effectiveness of real-world mass media campaigns in the field of alcohol reduction.

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Figure 1: Participants and timeframe of the longitudinal survey

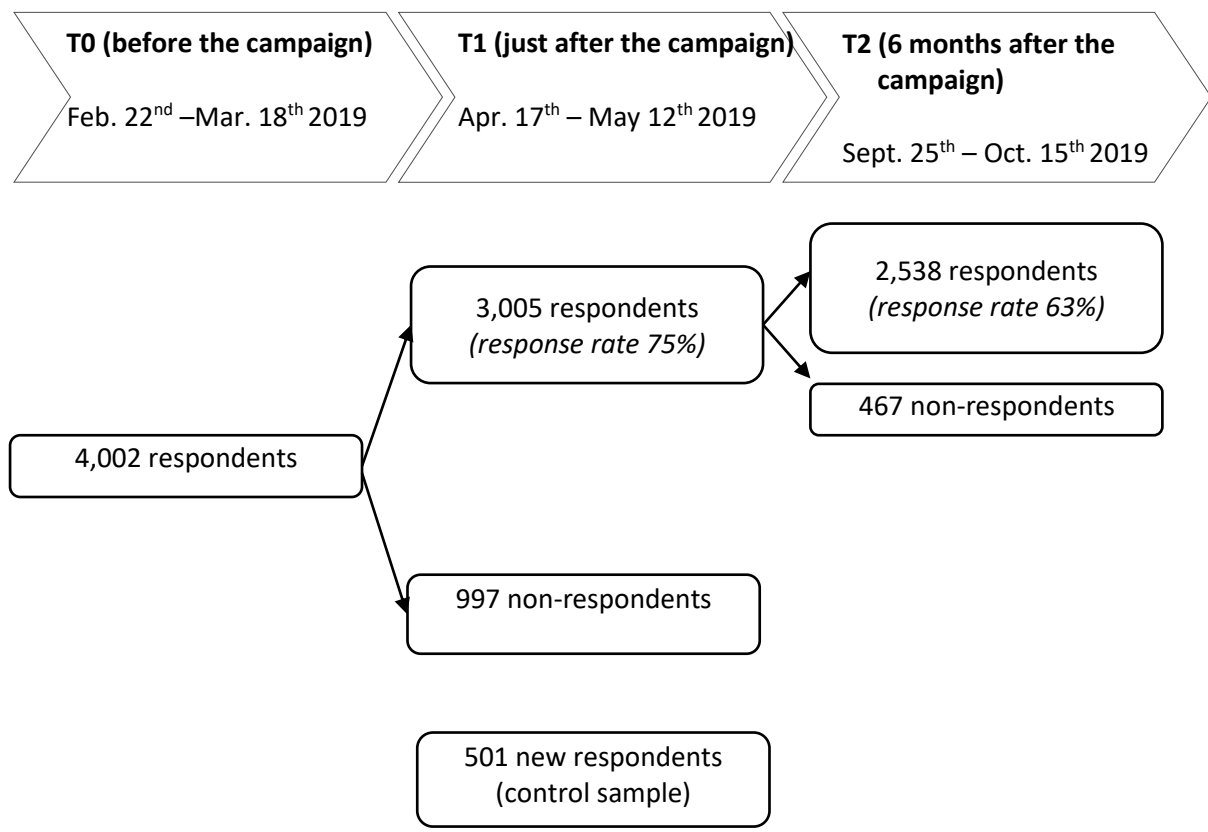


Table1. Global sample description

	Total (n=2,538)		Not exposed to the campaign (n=640)		Exposed to the campaign (n=1,898)		p-value
	n	%	n	%	n	%	
Sex							
Male	1300	50.4	318	49.1	982	50.8	0.457
Female	1238	49.6	322	50.9	916	49.2	
Age group (years)							
18-34	551	27.2	166	32.3	385	25.5	0.007
35-49	696	27.6	173	26.7	523	27.9	
50-64	789	28.6	177	25.1	612	29.8	
>=65 years	502	16.6	124	15.8	378	16.9	
Size of urban area							
Rural area	602	25.3	135	22.4	467	26.3	0.322
<20,000 inhabitants	420	17.3	109	17.9	311	17.1	
20,000-99,999 inhabitants	326	12.0	76	11.5	250	12.2	
>=100,000 inhabitants	793	30.2	212	31.8	581	29.7	
Paris area	397	15.2	108	16.5	289	14.8	
Education level							
Less than high-school diploma	685	26.1	147	21.7	538	27.7	0.002
Upper secondary school certificate	603	24.4	139	23.1	464	24.8	
Third-level diploma	1250	49.5	354	55.2	896	47.5	
Socio-professional category³							
High	1283	47.5	322	46.7	961	47.8	0.071
Low	1003	39.5	242	37.5	761	40.2	
Inactive	252	13.0	76	15.8	176	12.0	
Alcohol use							
Not exceeding LRDG	1569	61.7	405	62.9	1164	61.3	0.505
Exceeding LRDG	969	38.3	235	37.1	734	38.7	
Having thought about own alcohol consumption in the previous 30 days (at T0)							
No	2165	84.9	564	87.6	1601	84.0	0.038
Yes	373	15.1	76	12.4	297	16.0	
Desire to reduce alcohol use (at T0)							
No	1993	78.3	524	81.2	1469	77.3	0.044
Yes	545	21.7	116	18.8	429	22.7	

Note: The p-value refers to a Pearson Chi-square independence test between each row variable and exposure group.

Table2. Evolution of variables of interest in bivariate analysis (whole sample. n=2,538)

	Not exposed to the campaign (n=640)			Exposed to the campaign (n=1,898)		
	T0	T1	T2	T0	T1	T2
	%	%	%	%	%	%
Knowledge of the "maximum 2 alcohol drinks per day" LRDG guideline	34.5	42.0	38.8	34.1	48.2	41.3
Knowledge of the "2 days free from alcohol a week " LRDG guideline	5.9	9.8	9.6	6.7	12.9	10.7
LTH risk awareness in general related to alcohol consumption (totally agree)	43.5	43.4	44.8	43.7	48.5	47.0
Knowledge of alcohol-related cancer risk	74.9	80.6	85.3	79.0	86.5	86.0
Knowledge of alcohol-related hypertension risk	76.7	81.4	85.7	80.4	88.3	89.0
Knowledge of alcohol-related brain hemorrhage risk	56.9	65.5	71.7	61.2	80.1	76.0
Awareness of risk associated with own level of alcohol consumption (cf Tab4)	32.5	30.0	31.8	35.7	34.3	33.3
Intention to reduce alcohol consumption in the next 30 days	20.7	21.0	21.0	27.1	26.9	27.4
Alcohol consumption exceeding LRDG	37.1	39.7	35.9	38.7	37.3	39.6

Table3. Knowledge of LRDG. GEE models (whole sample. n=2,538)

	Maximum 2 alcohol drinks per day' LRDG guideline			'2 days without alcohol a week' LRDG guideline		
	OR	95% CI	p-value	OR	95% CI	p-value
Age (Years)						
18-34 (ref.)	1			1		
35-49	0.95	[0.80-1.12]	0.522	0.8	[0.61-1.05]	0.111
50-64	1.1	[0.93-1.30]	0.256	0.87	[0.66-1.14]	0.311
>=65 years	1.31	[1.09-1.57]	0.004	0.95	[0.71-1.28]	0.753
Education level						
Less than upper secondary school certificate (ref.)	1			1		
Upper secondary school certificate	0.94	[0.79-1.11]	0.44	0.96	[0.73-1.27]	0.784
Third-level diploma	0.88	[0.76-1.01]	0.078	1.24	[0.99-1.56]	0.067
Thought about own alcohol consumption in the previous 30 days at T0						
No (ref.)	1			1		
Yes	1.21	[1.00-1.47]	0.048	2.22	[1.66-2.97]	<0.001
Desire to reduce alcohol use at T0						
No (ref.)	1			1		
Yes	1.1	[0.93-1.31]	0.245	0.95	[0.73-1.24]	0.701
Campaign recall (at T0 survey wave)						
No (ref.)	1			1		
Yes	0.97	[0.80-1.17]	0.716	1.17	[0.80-1.71]	0.427
Survey wave (if no campaign recall)						
T0 (ref.)	1			1		
T1	1.37	[1.15-1.63]	<0.001	1.81	[1.28-2.57]	0.001
T2	1.2	[0.99-1.46]	0.066	1.78	[1.21-2.61]	0.003
Interaction recall * survey wave						

Recall = yes. survey wave = T1	1.32	[1.08-1.62]	0.008	1.18	[0.79-1.76]	0.416
Recall = yes. survey wave = T2	1.12	[0.89-1.39]	0.338	0.96	[0.62-1.49]	0.864
Overall test of interaction			0.026			0.461

Table 4. Secondary outcomes, GEE models, interactions between the survey wave and campaign recall (whole sample n=2,538)

	OR	95% CI	p-value
LTH risk awareness in general related to alcohol consumption (totally agree)			
Recall = yes, survey wave = T1	1.2	[0.98-1.47]	0.084
Recall = yes, survey wave = T2	1.08	[0.89-1.33]	0.427
Overall test of interaction			0.221
Knowledge of risk of alcohol-related cancer			
Recall = yes, wave = T1	1.24	[0.97-1.58]	0.081
Recall = yes, wave = T2	0.82	[0.63-1.07]	0.136
Overall test of interaction			0.007
Knowledge of risk of alcohol-related hypertension			
Recall = yes, wave = T1	1.41	[1.09-1.81]	0.008
Recall = yes, wave = T2	1.06	[0.79-1.41]	0.695
Overall test of interaction			0.025
Knowledge of risk of alcohol-related brain hemorrhage			
Recall = yes, wave = T1	1.8	[1.44-2.25]	<0.001
Recall = yes, wave = T2	1.03	[0.82-1.29]	0.805
Overall test of interaction			<0.001
Awareness of risk associated with own level of alcohol consumption			
Recall = yes, wave = T1	1.08	[0.87-1.36]	0.481
Recall = yes, wave = T2	0.95	[0.75-1.20]	0.658
Overall test of interaction			0.54
Intention to reduce alcohol consumption in the next 30 days			
Recall = yes, wave = T1	1.04	[0.76-1.42]	0.819
Recall = yes, wave = T2	1.06	[0.76-1.47]	0.741
Overall test of interaction			0.945

Note: GEE models were adjusted for age, education level, thinking about own alcohol consumption at T0, and desire to reduce drinking at T0.

Table 5. Alcohol consumption exceeding LRDG, GEE model, whole sample, n=2,538

	OR	95% CI	p-value
Age (years)			
18-34 (ref.)	1		
35-49	1.11	[0.92-1.35]	0.271
50-64	1.24	[1.02-1.51]	0.028
>= 65	1.28	[1.04-1.59]	0.02
Education level			
Less than upper secondary school certificate (ref.)	1		
Upper secondary school certificate	0.87	[0.72-1.06]	0.166
Third-level diploma	0.86	[0.73-1.02]	0.076
Thought about own alcohol consumption in the previous 30 days (at T0)			
No (ref.)	1		
Yes	3.15	[2.53-3.93]	<0.001
Desire to reduce alcohol use at T0			
No (ref.)	1		
Yes	1.56	[1.29-1.88]	<0.001
Campaign recall (T0 survey wave)			
No (ref.)	1		
Yes	1.00	[0.83-1.21]	0.995
Survey wave (if no campaign recall)			
T0 (ref.)	1		
T1	1.15	[0.98-1.35]	0.084
T2	0.96	[0.81-1.14]	0.678
Interaction recall * wave			
Recall = yes, survey wave = T1	0.83	[0.69-0.99]	0.043
Recall = yes, survey wave = T2	1.09	[0.89-1.33]	0.393
Overall test of interaction			0.017

Note: exceeding LRDG means having drunk more than a total of 10 standard drinks during the previous 7 days, and/or having drunk more than 2 drinks in any day during the previous 7 days, and/or having drunk alcohol more than 5 of the previous 7 days.