Increasing breast cancer screening uptake: a randomized controlled experiment This is a very preliminary draft. Please do not quote.

Léontine Goldzahl^{*}, Guillaume Hollard Florence Jusot^{‡§}

Abstract

In France, every woman, aged from 50 to 74 years old, receives an invitation letter to get free screening (namely a mammography) to detect breast cancer in the national screening program. However, many policy makers consider that the uptake rate is still too low. This study uses behavioral interventions to increase breast cancer screening uptake rates. Our main assumption is that, because of some variability or biases in their decision process, women may be sensitive to the content and presentation of the invitation letter they received. Presenting the right information the right way may help some women to overcome potential barriers and to frame routine screening as the status quo. We conducted a large scale randomized controlled experiment which consists in varying several features of the invitations letters: (1) adding the Health insurance funds logos on the invitation letterâÅŹs envelope, (2) indicating how many women screened in the program the preceding year, (3) a new written content and (4) a combined treatment composed of treatments (1) and (3). Our main result is that, despite a large sample of 26,495 women, none of our four treatments had any significant impact on mammography use. Complementary analysis show that even for women invited for the first time or those whose decisions are more prone to bias (low income women), treatments had no effects. Furthermore, mammography use is found to be stable across time, as if women chose to screen (or not), and they keep making the same decision. Our favorite interpretation is that every thing goes as if women were already making optimal screening decisions.

Keywords: nudge, cancer screening, randomized experiment JEL classification: D03; I18

 $[\]label{eq:post} * PSL, Universit\'e Paris-Dauphine, Leda-Legos, France. E-mail: leontine.goldzahl@dauphine.fr$

 $^{^{\}dagger}\mathrm{Ecole}$ Polytechnique and CNRS, France

[‡]PSL, Université Paris-Dauphine, Leda-Legos, France

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1 Introduction

Early screening increases the likelihood to detect a cancer at a more local stage, thereby improving survival rate. To prevent asymptomatic breast cancer from progressing to a metastasic stage, national screening programs were established in many countries. Eligible women receive an invitation letter containing a voucher for free screening (namely a mammography). Women are free to undertake the exam or not. Yet, many policy makers consider that up-take rates are still too low. Improving uptake rates is thus an important policy objective.

The present paper uses a large scale RCT with four treatments corresponding to various behavioral interventions¹. Each treatment consists in changing some aspects of the invitation letters based on insights from behavioral economics and psychology. Our behavioral interventions contrast with most previous approaches which either provide extra information (e.g. adding a leaflet to the letters) or financial incentives (e.g. a cash reward is attributed to those who undertake the tests). A desirable feature of the type of interventions studied here is that they are almost costless as changing the letters entails no additional cost. In addition, our behavioral interventions let the individuals free to choose what they believe is best for themselves because they mainly focus on the way the information is presented so that it may be better taken into account in the decision making process. It is important to note that mammographies are not an innocuous exam and that some women may choose not to undertake such exams for good reasons.

Our main hypothesis is that, because of some variability or biases in their decision process, women may be sensitive to the content and presentation of the invitation letter they receive. Presenting the right information the right way may help some women to overcome potential fears or distrust/cognitive or psychogical bias and to frame routine care as the status quo (Ackerson and Preston (2009)). The alternative hypothesis would be that women already gathered all relevant information and reached an informed decision that correctly balanced the pros and cons of undertaking a mammography to detect breast cancer.

Our main result is that, despite a large sample of n=27,284 women, none of our four treatments had any significant impact on uptake rates. We then run complementary analysis to better understand this negative result. It appear that even women who received their invitation letter for the first time are not sensitive to treatment effects, as if they were already correctly informed. Furthermore, uptake decisions are found to be stable across time, as if women choose to screen (or not) once for all. Our favorite interpretation is that every thing goes on as if women are taking clear and well informed decisions. In short, one can, as a first approximation, consider their behavior as optimal.

Performing a bunch of robustness checks suggests that one can be reasonably confident about the generality of our results, raising interesting policy issues.

¹Behavioral interventions represent a variety of actions inspired by behavioral economics. It includes "nudges" Thaler and Sunstein (2008). But also refers to providing specific information using behavioral insights. For instance, providing a new information about the behaviour of others. See below for a more elaborated discussion

2 Review

2.1 Nudges and Behavioral interventions: definition and interest

Policy makers often wish to change behaviors. Traditional public policies rely on two main channels to promote a particular behavior: information and incentives. By providing easy access to relevant information and decreasing the cost (or increasing the benefits) of adopting the recommended behavior, the goal is to make individuals reconsider their trade-off between a decision's costs and benefits. A third channel has been popularized by Thaler and Sunstein (2008) under the name of nudges. A nudge intervention takes advantage of individuals' cognitive or psychological patterns (status-quo, hyperbolic discounting for example) by changing the architecture of the choice in order to influence their behaviors. A simple example of a nudge would be placing healthy foods in a school cafeteria at eye level, while putting less-healthy junk food in harder-to-reach places. Individuals are not actually prevented from eating whatever they want, but arranging the food choices that way causes people to eat less junk food and more healthy food. As can be seen from this example, a typical nudge intervention provides in expensive ways to have an influence on the decision making process while respecting individual's freedom to choose what they consider best for themselves.

A pure nudge would be a way to influence the decision process, without adding any information. According to this restrictive definition nudges have an effect because they are able to change the way individuals process information (for instance, they can change from a fast and automatic decision process to a slow and explicit one as suggested by Kahneman (2003)). However, in practice, nudges are often combined with changes in available information. For instance, the choice of a way to present written material is hard to distinguish from a nudge. Furthermore, behavioral economics suggests additional ways of influencing the deliberation process. For instance reducing the perceived complexity of the choice problem may help individuals reaching a decision that take all available information into account. As a result, we prefer to speak of behavioral interventions, in a broad sense, rather than nudge alone.

2.2 Why behavioral interventions (and not incentives or information)?

National programs were implemented in many western countries to increase uptake rates. The general principle is to send every two years a letter which contains an invitation to undertake a free mammography. The French program for instance was successful to increase uptake rates by 12% (Buchmueller and Goldzahl (2017)). Carrieri and Wuebker (2016) finds that organized screening program increased participation to breast cancer screening by 24% in Europe. However, uptakes rates often reached a stable upper bound. For instance the French program is now stable at a 52% rate for the last 8 years (as of 2016). Several attempts were made to increase uptake rates. These attempts can be classified according to whether they intend to change behavior based on financial incentives or based on providing more information. In what follow, we review existing evidence regarding the effectiveness of each channel.

Incentives: Four studies investigated the incentive channel by tesing financial incentive mechanism rewarding cancer screening uptake. Gupta et al. (2016)'s interventions randomly assigned \$5 or \$10 Walmart vouchers (n=1000 in each treatment arm and n =6,565 in control group) in addition of a mailed invitation with the test with phone call reminders. Bowel cancer screening did not differ between incentivized and not incentivized group. Interestingly, the \$10 group screened significantly less than the \$5 group suggesting a boomerang effect of higher financial incentives. Kullgren et al. (2014)'s study tested various amount (\$5, \$10, \$20 with n=713) and fixed vs lottery (n=836) financial incentives to increase the completion rate of bowel cancer screening. While none of the various fixed payment did change test completion, the lottery incentive increased test completion by 19% (P<0.01) compared to control group. Merrick et al. (2015)'s study also tests fixed vs lottery payments for rewarding breast cancer screening (n=4427) and find no differences in mammography use. Slater et al. (2005) tested whether an enhanced letter, or an enhanced letter that also offers a \$10 incentive if they get mammography within a year would increase breast cancer screening among low-income women (n = 145,467). The financial incentive treatment group increased mammography use by 0.75% compared to the control group. These results suggest that financial incentives rewarding cancer screening yield mixed results. When financial incentives are found increasing the uptake rate they are either not replicable (lottery design) or one can cast some doubts that the ratio costeffectiveness is positive when \$10 provided upon completion increased screening by 0.75%.

Another intervention, addressing specifically the opportunity cost related to the distance to the radiologist, includes mobile mammography screening programs (namely trucks with mammography materials, called "Mammobile"). Vallée (2016) reports that Mammobile are expensive, have technical limitations and don't seem to increase the uptake rate when Mammobile are available. Transaction costs do not seem to constitute a great limitation thus.

Information: The information channel was explored by two large scale studies in France and in England (Trial 1 and 2 of Wardle et al. (2016) and Bourmaud et al. (2016)). Both studies consisted in adding an additional leaflet to existing invitation letters, for bowel and breast cancers respectively. In trial 1 of Wardle et al. (2016), the leaflet summarizes the gist of the key information about bowel cancer. Despite a large sample size (n=163,525), the supplementary leaflet is found to have no effect on uptake rates. In their second trial (n=149,871), Wardle et al. (2016) found that adding a narrative leaflet including interviews' excerpts of people who already screened did not have any effect on uptake rates. Bourmaud et al. (2016)'s study also consists in adding a 12 pages leaflet, about breast cancer to a sample of 16,000 eligible women. They found a negative effect, driven by a specific geographical area. So adding information is found to have a limited impact on well established programs. This suggests to concentrate the attention on changing invitation letters (rather than adding an extra leaflet) to avoid increasing the total mass of written material.

As explained, increasing uptake rates any further seems difficult using the traditional channels, namely information and incentives. Behavioral interventions somehow represent the last hope to have any significant impact within the actual system (i.e. sending invitation letters for a free screening) at a reasonable cost.

2.3 Designing new behavioral interventions: lessons from past studies

Behavioral interventions modifying the invitation letter itself seems more effective than providing information in a leaflet in addition to the letter (Wardle et al. (2016)'s trial 1 and 2 and Bourmaud et al. (2016)). The main piece of evidence going along this line are trials 3 and 4 of Wardle et al. (2016). In trial 3 (n=264,325), they included a signature of the GP practice to which the letter's receiver was affiliated. In trial 4 (n=167,741), the reminder letter includes (a) a short paragraph saying that the risk increases with age, and a free phone number to get advise and (b) a banner on top of the letter saying "A reminder to you". In both trials, the uptake rate for bowel cancer increased by 0.7%. The behavioral insights applied in this study are a messenger effect such that GP practice is seen as conveying the invitation and a saliency effect as the banner is very obvious on the letter and attracts attention.

A key issue with actions on letters is that we are not sure that individuals who receive them do actually read them. Bourmaud et al. (2016)'s study includes a post-treatment phone survey which gives an indication of the actual reading rates, which is found to be about 30%. This suggests that treatments which signal that the envelope contains important information may be welcome. Our first treatment adds a the logo of the three main health insurance funds on the envelope containing the invitation letter to signal the importance of the content.

Another point is the way written material of the letter was tested before being sent. Most studies are rather silent regarding how the letters and leaflets sent are designed. However, some letters may be judged better than others by the individuals who received them. And this opinion on the quality of the letters may be different from the opinion of people who design these letters. This suggests to introduce a treatment based on a letter that was recognized as good by the recipients. Our second treatment includes a letter that went through a selection process by women eligible for the breast cancer screening program.

Lastly, social psychology and community-based approach² suggest that providing information on what peers do would influence one's behavior. The effect is summarized by the following sentence "If everyone is doing it, it must be a sensible thing to do" in Keizer, Lindenberg and Steg (2008). Social norms interventions have been tested in various domains as restaurant menu choice (Cai, Chen and Fang (2009)), music choices (Salganik, Dodds and Watts (2006)), pro-environmental behaviors (Griskevicius, Cialdini and Goldstein (2008), Ayres, Raseman and Shih (2013)), contribution on retirement plan (Beshears et al. (2015)) and voting participation (Gerber and Rogers (2009)). social norms intervention are found to be more effective when individuals can identify themselves to the reference group, i.e. when they consider members of the group as peers. For example, the normative messages used in hotel bathrooms increased towel reuse of visitors by 4% when the reference group changed from "most guests at the hotel reuse their towel" to "most previous occupants of the

²For instance, local authorities developped a network of informed women who already screened spread information about breast cancer screening in their community.

room reused their towel" (Cialdini (2003)). In the same vein and closer to our purpose, Bronchetti, Huffman and Magenheim (2015) used a field controlled experiment to test interventions conveyed through an email aiming at increasing flu vaccine among American students. The peer effect intervention is based on a peer endorsing the flu vaccine. The peer was a reference individual on campus (tutor or athlete) who sent directly the email to the participants.

Recent field experiments highlighted that social norm intervention may cause the opposite effect than the expected one, a socalled "boomerang" effectSchultz et al. (2007). In their experiment to test peer information on retirement plan choices, Beshears et al. (2015) argue boomerang effects arise because of negative belief update: individuals learn that the promoted activity is *less* widespread than they previously thought.

2.4 Other possible behavioral interventions

Other interventions exist but their efficiency did not reach a concensus in the literature or they were not feasible in our context. We however review a few.

Some studies have exploited the appointment system to change the default option. The usual default option is letting patients call and set the time of the appointment. The individual status-quo bias implies that they will stick to the the proposed default option. Following this idea, if individuals received a mail with the date and time of the already scheduled appointment, they will attend it more than if they have to call. But evidence on changing the default option in invitation letter is mixed (Narula et al. (2014) find a decrease in bowel cancer screening and Segnan et al. (1997) find an increase in cervical and breast cancer screening).

There are more studies which test various features, especially the opportunity to have tailored letters. Taylored letter consists in gathering information (as perceived barriers to attend screening) on the receiver and to adjust the letter content accordingly. However, they have in common to rely on rather small samples (n < 1000). They may however be informative since they provide converging evidence of ineffectiveness. Among recent evidence, Vernon et al. (2008) randomized two intervention groups with various levels of tailored interventions compared with targeted-only intervention among American veterans and find no differences between the intervention and control groups. Bodurtha et al. (2009) tested if risk-tailored information or general information would increase mammography uptake. They find less than 2% not statistically significant difference between the two treatment arms. As a result, there is no strong evidence that tailored letters should be used.

Some other studies included a signature of the GP on the invitation letter (Wardle et al. (2016), Segnan et al. (1997), Senore et al. (2015)) or Health authorities or a celebrity (Stein et al. (2005)). While only the signature on the GP seems to increase screening uptake rate, it suppose share information on the link between the GP and management structures in charge of the screening program that is not available in France.

3 Experimental design

3.1 Contextual features

The experiment was simultaneously conducted in two *départements*, Seine-Maritime and Eure, in the Haute-Normandie region of France. There are 1.85 millions inhabitants and 275,652 women aged 50 to 74 years old (therefore eligible to the national screening program). The choice of this two departments arised for statistical reasons (one is more urban and educated, the other one more rural) but also from pratical issues. The structures in charge of managing the program in each departments were willing to undertake a randomized experiment. Without a full support of the local teams our experiment would have been impossible to run. As indicated in the timeline figure, the intervention took place in April 2015 and data were collected the subsequent year.



Figure 1: Timeling of the experiment and data collection

Treatments are conveyed by the invitation letter sent to eligible women. Letters contain a voucher that give access to a free mammography. The managing structure sends the letters and collect the information each time a women used her voucher. However, whether or not a woman receives a letter of invitation, she is still free to screen outside the program. We refer to that situation as opportunistic screening. The service she gets by doing so is exactly the same (the exam can only be performed in a center that welcomes vouchers). There are two differences however. In case of opportunistic screening, she would face some out-of-pocket expenses (about 66 euro) and need a prescription. Second, mammography undertaken inside the national program are all sent for a second reading to the managing structure (while opportunistic ones are not). To collect data about opportunistic screening, we collected data from the French social security administration since the managing structure does not receive corresponding information.³

The invitation letter has to follow guidelines defined by the National Institute of Cancer (i.e. it has to include information about mammography and the organized program, as well as a list of radiologists participating in the program in their département). The guidelines leave sufficient

³The National Health Insurance funds can identify each health care consumption thanks to the medical acts classification code (Code de Classification des Actes Médicaux). This coding system allows us to know if women screened for breast cancer in the 12 months after the invitation was sent or if she screened during the 12 months before the invitations were sent. This classification code distinguishes between organized screening (coded QEQK004), opportunistic screening (coded QEQK001) and follow-up mammograms (coded QEQK005).

room to modify the letters in a substancial manner. We designed four treatments jointly with the head of each manageming structure and a representative for each National Health Insurance funds of Haute-Normandie. Each treated invitation was randomly sent to a woman who was supposed to be invited anyway in April or May 2015. Women in the control group received the usual invitation of each management structure which has never changed since the program was extended nationwide in 2004 in both départements. Even if they have the same default option (i.e. the usual letter), the usual invitation letters from the two départements differ enough so that treatmentsâĂŹ effects will be assessed separatly in each département

3.2 Treatments

We randomized invitations across 5 groups: a control group and 4 treatment groups. Treatments are conveyed by the invitation letter sent to eligible women and are hence embedded in the screening system. It makes our intervention almost costless and easily replicable. Details about each treatment are given below. Choices regarding the number and the nature of the treatments arised in relation to existing results. As pointed out in our review sections, important insights can be gained from existing results. The number of treatment (five) was chosen so as to have enough statistical power in each department.

3.2.1 Logo treatment

By default the envelope already has the logo of the management structure in charge of breast cancer's prevention on it. But this logo is hardly recognized and not very well known. In our "logo" treatment, the three official logos of the National Health Insurances funds were added⁴. National Health Insurance funds are trustworthy, well known, health institutions. Adding these official logos on the envelope provides a clear signal that letters come from an official institution. The treated envelop as it was sent is available in figure 6 in appendix D.

Based on the saliency effect triggered by the logos, we expect the logo treatment to increase the probability of the enveloppes to be opened. We also expect official logos to increase the trust put into the information contain in the letters through a messenger effect.

3.2.2 Simplicity treatment

As already explained, most studies are rather silent regarding how the written material sent was selected. We here use a sample of 104 eligible women to evaluate invitation letters. The evaluation was included in a longer questionnaire directly presented to respondents. Each respondents received a set of 5 invitation letters: the two default or control invitation letters used in each département (labeled as "Eure" and "Seine Maritime"), the initial letter suggested to management structures by the National Institute of Cancer (labeled as "National") and two additional letters that we wrote in

⁴Namely, CNAMTS (National Health Insurance Fund for Employees), the RSI (National Insurance Fund for Self-employed Workers fund), the MSA (Agricultural Social Mutual fund. These three insurances correspond to the National Health Insurance funds (Assurance Maladie).

collaboration with the management structures (labeled as "Test1" and "Test2"). The full invitation letters set is available in annexe C. The five letters were displayed in a neutral aspect such that only the textual content differed. Respondent had to physically rank the 5 letters with their prefered one on top. The question asked was "Rank the letters by putting first the one you prefer (clearer, providing more incentive for instance) and last the one you liked the least.". We excluded from the sample any respondent who did not complete either the questionnaire or the task (24 women over 128 (18.7%)).

There are various ways of evaluating which letter is best. We are here facing a social choice problem and it is well-known that a social ordering can be obtained in several (potentially conflicting) ways. However, individual rankings were easy to aggregate. In particular, the letter "National" was obviously found better. It is for instance preferred to its closest competitor (i.e. "Eure") by 61.5% of the respondents. The robustness of the ranking according to various criteria can be assessed from tableI.

	Average ranking	Ranked 1rst (prop.)	Ranked 1rst or 2nd	Majority ranking
National	2.26	44~(42.3%)	63~(60.6%)	1
EURE	2.76	22~(21.2%)	47~(45.2%)	2
Seine Maritime	2.95	12 (11.5%)	41 (39.4%)	3
Test1	2.97	17~(16.3%)	39(37.4%)	4
Test2	4.06	9~(8.7%)	18 (17.4%)	5
Obs	104	104 (100%)	208 (200%)	

Table I: Selection process analys	Table	le I: Se	election	process	analys	1S
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Majority ranking are obtained by comparing each pair of options. An option that is prefered by a majority to each other options is ranked first, and so on. Note that majority rankings may not exists since the aggregation of individual preference can lead to cycles

Our purpose is to select the best letter as our best chance to increase uptake rates. We assume that the prefered letter is also the most appropriate to convey the information.

Interestingly enough, *test1* and *test2* were elaborated by ourselves in collaboration with people usually in charge of writing these letters. However, letters *test1* and *test2* were not selected by the eligible women as they were no found clearer.

3.2.3 Mixed treatment

The mixed treatment is simply an addition of the logo treatment and the simplicity treatment. Our aim is to maximize the odds that letters will be opened and that the letter will be easily understood.

3.2.4 Social norm

As explained above, social norms interventions consist in providing information about what others are doing. In particular, rather than anonymous others, social norms work best when the reference are peers (i.e. similar individuals). We thus choose our reference group as bieng women living in the same *département*. The peer information provided in this treatment is the number of women in one's *département* who screened in the program the year before. Revealing that screening avoidance

is more pervasive than previously believed could crowd-out screening attendance because a lower uptake rate than the one the receiver expects may negatively affect beliefs. We thus choose to provide the absolute number of participants in the previous year which is sizable number. The exact wording reads: "In 2014, 17,682 women screened in the national program in Eure. Why not you?". This sentence is introduced in the invitation letter between the 1st and the 2nd paragraphs. It constitutes a paragraph on its own as shown in Appendix D on figure 5.

4 Data and empirical strategy

A total of 27,137 invitation letters were sent. A small fraction, 2.37%, were sent came back to the management structures as "not living at this address". Hence, our final sample is N=26,495, with $N_{Eure}=10,411$ (40%) and $N_{SeineMaritime}=16,084$ (60%). The main outcome is Total screening. To obtain this variable, we merge data from the structures in charge with the ones from health insurrance. It is almost impossible to get a mammography without appearing in our dataset. Total screening equals 1 if a participant had a mammogram within a year after being invited. Other available individual characteristics in our dataset are described in appendix B.0.3. The random assignment of treated letters means that, in expectation, women in the control and various treatment groups have comparable background characteristics. Thus, they would have, on average, comparable outcomes in the absence of change in the letters. By comparing outcomes between each treated group and the control group, we can estimate the effect of each treated letter we are testing Multiple testing problem has received a growing attention recently as many authors re-conducted the analysis of randomized controlled studies and provide new results when adjusting for the multiplicity of hypothesis (RCTs on education and health programs (REF. Progress etc. Heckman) as well as charity field experiment (REF. List etc.)). The family of hypothesis in this study corresponds to the null hypothesis that each of the four treatments has a similar effect on mammography use (total, organized or opportunistic screenings) than the control group for the full sample as well as in each sub-population of interest. If the multiplicity of tests is not taken care of, then the probability of a true null hypothesis being rejected alone increases with the number of tests. To avoid erroneously rejecting the null hypothesis, we use Holm-Bonferroni procedure that controls the family-wise error rate. This method does not assume any dependent structure between the tests and therefore provides a fairly conservative results for tests that may be dependent. In our case, we can assume that while treatments are independent, the three outcomes are not.

5 Results

To interpret the results, it is important to check that the experimental design was actually implemented as planned. Table A present summary statistics on experiment implementation in the two départements seperatly. Difference across treatment and control groups are tested wile correcting for the family-wise error rate using the same Holm-Bonferroni method. Differences in bold indicates unadjusted differences and * for adjusted P-value smaller than 0.1. Differences across treatment and control groups are small in magnitude, and only 3 of 57 adjusted p-values estimated are smaller than 0.10, suggesting that the randomization was effective at creating balance between the groups.

Table II present in column 2 and 4 the mean in the control group, column 3 and 5 present the difference between the proportion of women who undertake screen in the treatment and control group with the standard errors in parenthesis⁵. If the difference were written in bold the unadjusted P-values would be statistically significant and if stars were added the adjusted P-values with the Holm-Bonferoni method would be smaller than 0.1. No treatment has a an impact on the probability to screen.

Figure 2: Treatment effects on screening uptake



Table II: Treatment effects on total screening uptake

		Seine-Maritime	;		Eure	
Treatment	Ν	Mean in Control gr	Diff. T-C	Ν	Mean in Control gr	Diff. T-C
Logo	$3,\!227$	48.37	-0.27	2,069	46.39	-2.4
			(0.012)			(0.015)
Simplicity	$3,\!214$	48.37	-1.1	2,101	46.39	-0.22
			(0.012)			(0.015)
Descr. norm	$3,\!234$	48.37	0.12	2,073	46.39	-1.5
			(0.012)			(0.015)
Logo+Simplicity	3,223	48.37	-1.1	2,077	46.39	-0.27
			(0.012)			(0.015)

⁵As a robustness check, a regression analysis was conducted to include a set of covariates. Indeed, it may improve the precision of the estimates, it may remove the biases if the randomozation failed. Results are available in appendix XXX and results don't change.



Figure 3: Uptake rate since national program's implementation

5.1 Analysis and interpretation

The presented RCT delivers clear and unambiguous result: none of our four treatments caused any significant change in screening behavior. How should one interpret these results? The kind of interventions we used, namely behavioral interventions, are not suppose to be effective.

6 Complementary analysis

6.1 Constant behavior

In both départements, mammography use is mainly explained by their screening habit. The histograms clearly show that those who screen last time their were invited screen again and those who did not screen in 2013 are again not screen when we invited them. Furthermore, screening habits explain 40% of the variance in mammography use in Eure and 30% in the Seine-Maritime. Figure ?? shows that in both départements and in the entire country, after the implementation of the program, the uptake rates increased and then stays around 55% since 2008. A similar pattern is observed in the UK where the national program started in 1995. No treatment seems to have an effect that is robust across econometric specifications and across *départements*. It seems that screening uptake is defined by strong screening habits that are not affected by our interventions. Any women older than 50 years old have already received the invitation and may not always read it to decide to screen again. For women who were invited in the past, the invitation letter operates rather more as a reminder to screen than information considered to make a decision. Women that just turned 50 years old are newly eligible to the screening program. Hence, they have not previously been exposed to the invitation letter. We investigate the effect of our treatments on this sub-population.

6.2 Treatment effects on screening uptake among the new eligible

The new eligible sub-group includes women aged 50 years old who are invited for the first time. Because they receive the invitation for the first time, we believe there is a higher chance that they would open the enveloppe. Figure 4 (c) shows that every treatment has a detrimental effect on the uptake rate compared to the control group in the Eure while no treatment has an effect in the Seine-Maritime. None of these differences statistically significant when adjusting for the multiplicity of tests (table III).

		Seine-Maritim	e		Eure	
Treatment	Ν	Mean in Control gr	Diff. T-C	Ν	Mean in Control gr	Diff. T-C
Logo	265	49	0.8	762	60.6	-14.8
			(0.042)			(0.054)
Simplicity	329	49	2.1	762	60.6	-12.8
			(0.040)			(0.057)
Descr. norm	294	49	-1.7	762	60.6	-16.6
			(0.041)			(0.056)
Logo+Simplicity	268	49	-3.5	762	60.6	-12.7
			(0.042)			(0.057)

Table III: Treatments effects on total screening among **new eligible** (50 yo)

6.2.1 Treatment effects among low income women

We expect our treatment to be especially efficient in increasing mammography use among a low income population since they are known to be choosing suboptimal preventive care levels. We use the objective measure of income which is being a beneficiary of the CMUC or ACS. Figure 4 and table IV show how each treatment and the control group does not change the uptake rate among low income women.

Table IV: Treatments effects on total screening among low-income women

		Seine-Maritime			Eure	
Treatment	Ν	Mean in Control gr.	Diff. T-C	Ν	Mean in Control gr.	Diff. T-C
Logo	1,238	36.4	-0.75	476	33	-7.1
			(0.045)			(0.069)
Simplicity	1,238	36.4	-6.9	476	33	1.3
			(0.042)			(0.069)
Descr. norm	1,238	36.4	-8.2	476	33	0.74
			(0.042)			(0.07)
Logo+Simplicity	1,238	36.4	-8.3	476	33	-3.58
			(0.041)			(0.07)





(a) Organized screening uptake



7 Robustness and limits

7.1 Organized screening may offset opportunistic screening

Figure 4 (a) and (b) displays the uptake rates and confidence intervals for each treatment and control groups for organized screening and opportunistic screening.

As shown in table V, treatment effects are not statistically significant. Noticeably, all treatments had a negative impact on organized screening and a positive one on opportunistic screening. We can distinguish a pattern if we assume that the logo drives the effect. The impact of the logo treatment on organized screening is negative. At the same time, the treatment combining the Logo and Simplicity treatments and the logo treatment increased the opportunistic screening uptake rate. The logo seems to have a negative impact on organized screening and a positive one on opportunistic screening. It suggests that there is a substitution between organized and opportunistic screening induced by the logo added to the enveloppe.

If we look at uptake rates' magnitude, the organized screening uptake rate reaches 42.36 in the Eure and 45.65 in the Seine-Maritime a year after the invitation. We can't directly compare these uptake rates to the annual uptake rate published by the management structures because we don't have the same method and they are not observed on similar periods of time. The annual uptake rate published by the management structures is the ratio between the number of organized screening performed over a year regardless of when women were invited divided by the half of the eligible population according to the INSEE. According to this method, the national uptake rate is 52% and it reached 56.2% in the Eure and 58.2% in Seine-Maritime in 2014. Our method yields smaller uptake rates but the Eure's is still smaller than the one in Seine-Maritime. For the opportunistic screening, we only take into account opportunistic screenings that were undertaken after the invitation were sent and exclude follow-up mammograms or organized screenings. Compared with the national average uptake rate in opportunistic screening estimated by the Haute Autorité de Santé (2011) to be 10%, both the Eure and Seine-Maritime have a smaller uptake rate reaching on average respectively 3.17 and 2.26%.

		Seine-Maritime			Eure	
Organized scree	ening					
Treatment	Ν	Mean in Control gr	Diff. T-C	N	Mean in Control gr	Diff. T-C
Logo	16,084	46.45	-1.06	10,411	43.47	-2.4
			(0.012)			(0.015)
Simplicity	$16,\!084$	46.45	-1.2	10,411	43.47	-0.30
			(0.042)			(0.015)
Descr. norm	$16,\!084$	46.45	-0.16	10,411	43.47	-1.55
			(0.042)			(0.015)
Logo+Simplicity	16,084	46.45	-1.56	10,411	43.47	-1.25
			(0.041)			(0.015)
Opportunistic s	creening	Š				
Logo	16,084	1.91	0.78	10,411	2.92	0.128
			(0.004)			(0.005)
Simplicity	16,084	1.91	0.139	10,411	2.92	0.081
			(0.003)			(0.005)
Descr. norm	16,084	1.91	0.281	10,411	2.92	0.074
			(0.003)			(0.005)
Logo+Simplicity	16,084	1.91	0.505	10,411	2.92	0.983
			(0.004)			(0.006)

Table V: Treatment effects on organized and opportunistic screenings

7.2 Scaling-up/external validity

7.2.1 Stylized facts of the literature

The literature provides evidence that low income, being sick, low health insurance coverage and low health care consumption are associated low mammography use (Carrieri and Wübker (2013), Goldzahl and Jusot (2016), Sicsic and Franc (2014) Devaux (2015), Wübker (2014), Jusot, Or and Sirven (2012), Hsia et al. (2000), Trivedi, Rakowski and Ayanian (2008)). Regressing these determinants on mammography use on pooled data (both départements) show that similar trends apply in our sample (in table VI in the appendix). Women in our sample display behaviors in line with existing evidence such that our results may be valid among women living in similar conditions.

7.2.2 Two different départments are similar to the country

Our département are very similar to the national figures as shown in table A. Our intervention is tested in two déparetment as if we would have replicated the intervention in another département to check if results hold. While the two départements are border areas and belong to the same administrative region (they share the same Regional Health Authoriy), they differ in a number of ways. Policy recommendation will only be attached to treatment effects robust to contextual features. It means that our conclusion are only based on treatment effects holding in the two départements.

7.3 Limits

The control group letter only slightly differs for women living in the Eure who screened in 2013 and were invited 2 years later. A sentence indicating the date at which they lastly undertook a mammogram was written in it and we could not keep it in the experiment.

7.3.1 Distrust in the Health insurance funds

Our treatment may not convey the expected message if the Health Insurance funds logos are distrusted but the Eurobarometer's survey of 2013 reports that 88% of the French population think that the quality of care is good in France. In addition, French respondents believe that the ministry of health or related national authority are as much responsible for patient's safety as hospitals and doctors (41 ans 40% respectively). Unfortunatly no survey specifically investigated if each of the three major health insurance funds were trusted by their insured.

7.3.2 ITT

Although we can exclude from the sample women "not living at this adress" as the letter was returned to the management structure, we still adopt an intention-to-treat (ITT) perspective. An ITT analysis is based on the initial allocation of treatment and not on the treatment eventually received. ITT is chosen because we don't know how many letters will reach their receivers and therefore how many will be eventually exposed to the treatment. Note that for all treatments except the logo one, the letter needs to be opened and read but we can't control for that to happen.

8 Lessons learned from the experiment

The objective of this experiment was to increase breast cancer screening uptake in the national program by modifying the invitation letters according to four nudge interventions. We used a large scale RCT to test if behavioral interventions may increase breast cancer screening while letting individuals choose what they think is best for themselves. None of our various treatment changed breast cancer screening. Our results suggest that women have already chosen their optimal level of breast cancer screening and there is no cheap intervention that would change it.

Another plausible explanation is that the letter is not the appropriate mean to convey the information to change breast cancer screening behaviors. Further studies should try to use other means to influence breast cancer screening uptake.

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Appendix A Tables of the randomisation checks

			Sein	e-Maritime						Eure			
	Control	Logo	Lit.	Desc. Norm	L+S	Total S-M	Control	Logo	Lit.	Desc. Norm	L+S	Total Eure	Total France
Full sample	19.81	20.06	19.98	20.11	20.04	20	20.08	19.87	20.18	19.91	19.95	20	
Past screening													
Screened	39.42	37.99	38.08	38.1	38.5	38.42	37.11	36.25	37.6	37.14	37.79	37.18	
Not screened	46.61	49.05	46.83	48.3	48.84	47.93	44.91	45.82	45.98	44.72	44.58	45.2	
Refused	1.63	1.98	2.02	1.73	1.52	1.78	6.98	7.39	6.95	7.86	8.28	7.49	
New eligible	9.29	8.21	10.24	9.09	8.32	9.03	7.65	8.12	6.66	7.24	6.93	7.32	5.6
New comer	3.04	2.76	2.83	2.78	2.82	2.85	3.35	2.42	2.81	3.04	2.41	2.8	
Deprivation index													
1 quintile	18.3	17.97	18.01	18.37	18.68	18.27	23.43	21.02	21.09	22.05	22.82	22.08	
2 quintile	12.77	14.29	13.94	12.18	13.84	13.4	18.84	18.27	17.99	17.37	16.9	17.88	
3 quintile	10.42	11.59	11.14	10.27	10.58	10.8	11.19	12.76	13.9	11.96	12.33	12.43	
4 quintile	20.97	20.05	20.72	21.61	19.7	20.61	19.18	20.2	19.75	21.76	19.74	20.12	
5 quintile	37.54	36.1	36.19	37.57	37.2	36.92	27.36	27.74	27.27	26.87	28.21	27.49	
Compl. HI													
Private HI	70.34	71.15	70.38	70.22	69.16	70.25	68.24	64.52	65.06	63.15^{*}	65.48	65.3	
CMUC-ACS	7.6	6.79	7.81	8.01	8.28	7.7	3.92	4.49	5.14	4.87	4.43	4.57	5.77
None	22.07	22.06	21.81	21.77	22.56	22.05	27.83	30.98	29.8	31.98	30.09	30.13	
Age groups													
[50-54]	29.28	28.91	30.52	28.7	29.88	29.46	25.16	24.12	23.89	24.31	24.46	24.39	27.22
[55-59]	26.71	25.19	25.05	25.82	26.75	25.9	24.39	23.2	24.89	25.66	24.55	24.54	25.12
[60-64]	17.86	19.58	18.17	18.95	17.84	18.48	20.95	21.41	21.13	22.19	20.56	21.25	21.67
[65-69]	15.57	15.74	15.87	15.77	16.01	15.79	17.69	18.37	17.66	16.16	18.54	17.68	15.42
[70-75]	10.58	10.57	10.39	10.76	9.53	10.36	11.81	12.9	12.42	11.67	11.89	12.14	10.57
HI funds													
Regime Generale	90.14	90.18	90.54	90.14	89.98	90.2	85.03	82.65	83.34	81.86^{*}	83.29	83.24	78.81
MSA	1.76	1.95	1.59	2.01	2.2	1.9	3.68	3.38	3.24	4.1	3.08	3.5	6.11
RSI	0.31	0.34	0.44	0.34	0.31	0.35	4.54	4.88	4.71	5.45	5.3	4.98	5.37
MGEN	4.65	4.77	4.73	4.73	4.62	4.7	3.49	4.93	4.71	5.26	4.33	4.54	9.71
Other	3.14	2.76	2.71	2.78	2.89	2.85	3.25	4.16	4	3.33	4	3.75	
Chronic disease	28.71	28.65	27.08	29.14	28.65	28.45	28.15	26.7	26.57	27.39	27.09	27.18	23.98
GP visits													
0	13.97	13.02	13.5	13.64	13.4	13.5	23.39	23.1	23.04	24.6	23.5	23.52	
[1-3]	27.02	26.22	25.95	24.86	27.65	26.34	27.64	28.37	27.61	28.27	27.35	27.85	
[4-6]	27.5	29.63	29.15	29.44	28.3	28.81	25.39	27.98	27.46	25.04	27.3	26.64	
≥7	31.51	31.14	31.39	32.07	30.65	31.35	23.58	20.54	21.89	22.09	21.86	22	
Gyneco visit													
>1	9.07	8.46	8.09	8.69	8.87	8.64	10.57	10.58	9.85	11	10.54	10.51	
Bold text means t. Stars means that t	hat the diff the differen	erence bé ce betwee	stween the	e proportions portions in th	in the treatine treatine in the treatine in th	atment and co int and contro	ntrol grou	p is signif significan	icant with t at the 1	nout adjusting 0% level when	for the mainstant	t for the multi	est plicity of test

Appendix B Individual characteritics and their effect on screening outcomes

B.0.3 Individual characteristics

Breast cancer screening past behavior Data provided by each management structure allows us to distinguish 5 breast cancer consumer profiles. The first three profiles are determined from what they did the last time they were invited to screen in 2013^6 . The last two profiles relates to their eligibility in 2015 when we invited them. Women who were invited as part of our experiment were women who (a) screened 22 months ago⁷ (b) were invited 22 months ago but **did not screen** in the program since then (c) **refused** to participate after being invited 22 months ago, (d) are **new eligible** to the program because they have just turned 50 years old, (e) are **new comers** because they just arrived in the département and receive our invitation. Let's note that women in category (c) are very specific in the sense that they wrote or call back to the management structure to say that they refused to participate.

Socioeconomic characteristics We proxy socioeconomic characteristics using two variables: a deprivation index and complementary health insurance coverage.

The deprivation index

To offset the lack of socioeconomic data in Health Insurance funds datasets, every woman invited during the experiment had her postal address geocoded by experts from the IGN (National Institute of Geographic and Forest Information). From the geographical coordinates, we were able to associate each individual with a specific area of 2000 inhabitants called an IRIS on which we have aggregated socioeconomic information from census data collected by the French National Institute for Statistics and Economic Research (INSEE)⁸.

From this census data, we are able to construct an ecological deprivation index reflecting the socioeconomic situation with regard to the surrounding population. Deprivation indexes have been used in health studies since the 1970s using several methodologies such as principal component analysis, factor analysis, health experts opinion on which variables to include (Townsend (1987)). These indexes are used as a proxy of the individual's socioeconomic deprivation but don't refer to the individual's deprivation experience. We use Pornet et al. (2012) and Guillaume et al. (2016)'s index named the French version of the European Deprivation Index (EDI) because it selects census variables which closely represent the individual's perceptions of deprivation.

Complementary health insurance coverage

Being covered by a private or public complementary health insurance provides information on indi-

⁶Unfortunately, we don't have information on what happened before 2013.

⁷There is a difference between the two département. In the Eure (DECADE), women were invited every 22 months as in the Seine-Maritime (EMMA), they are invited every 20 months.

⁸The INSEE developed a system for dividing the country into units of equal size, known as "IRIS2000". In French, IRIS means aggregated units for statistical information", and the 2000 is the target size of 2000 inhabitants per unit. Metropolitan France is composed of around 15 450 IRIS.

vidual's income. Public complementary health insurance (Universal Medical Coverage and the Aide à la Complémentaire Santé provides financial help to pay a private complementary health insurance) solely depends on income. For instance, an individual has to earn less than 8645 euros per year (for a 1 individual household) to be eligible to the Universal Medical Coverage.

Health status and health care consumer profiles From the administrative data of the National Health Insurance funds, we approximate the health status by a binary variable representing if she has or had a chronic disease the year before or after the intervention, for which she is fully reimbursed by the Health Insurance funds (Affection de Longue Durée status). We were not able to get the type of chronic disease for personal data security reasons.

We capture health care consumer profiles with the number of visit to a GP in the year before the intervention and whether they consulted a gynecologist in the year before the intervention.

B.1 Descriptive statistics

From tables A, we observe the composition of our sample in each *département*. Among the screening profiles in both *départements*, the largest proportion is found in those who did not screened when last invitation were sent in 2013. There is much more women who refused to participate in screening in the Seine-Maritime *département* than in the Eure. We suspect that this is due to the following reason. While in Seine-Maritime, women who wrote back to the management structure because they undertook opportunistic screening are classified into those who had screened and their next invitation is rescheduled according to this opportunistic, women who undertook opportunistic screening and wrote back to the management structure are still classified as those who refused. This is supported by the fact that, in the Eure, 14% of women who refused to participate in the program in 2013 did an opportunistic screening in 2015/2016, which may be their healthcare habit. The 5th quintile of the deprivation index (the poorest one) includes 28% of the sample in the Eure and 38% of the sample in Seine-Maritime. The 1st quintile of the deprivation index (the richest one) includes 22%of the sample in the Eure and 18.3% of the sample in the Seine-Maritime. There also is a higher percentage of CMUC or ACS beneficiaries in Seine-Maritime than in the Eure. Considering that the amount of women without any complementary health insurance is 4 times bigger than the national average, we suspect that data from the Health Insurance funds are not reliable for those without any complementary health insurance or with a private health insurance. The reason is that ACS and CMIC a provided by the Health Insurance funds themselves and therefore reliable, whereas the Health Insurance Funds only have the information of the complementary health insurance if there is an automatic transmission between the complementary health insurance and the Health Insurance funds. Therefore the number of women with a private complementary health insurance is underestimated.

In line with the national average, the wide majority of women in the experiment are affiliated to the "Régime Général" (RG) which is made for all employee. The MGEN is the former health insurance fund of the employees of the National Education system, despite it is now open to everyone it is mainly composed of National Education employees (professors, teachers etc.). Almost one third of women in the sample had or have in the past years a chronic disease that is fully reimbursed by the Health Insurance funds. 22% of women in the Eure consulted a GP 7 or more times the year before the intervention, while in the Seine-Maritime the proportion is 31.3%. Roughly 10% of women in both départements visited a gynecologist.

B.2 Effect of covariates on screening outcomes

	Org. scr	eening	Opp. scr	eening	Total scr	eening
Health insurance fund (ref: RG)			• F F · • • •			
MSA	0.165	(0.144)	0.303	(0.320)	0.208	(0.143)
RSI	0.133	(0.144)	0.362	(0.309)	0.192	(0.142)
MGEN	0.170***	(0.049)	0.233**	(0.093)	0.197***	(0.048)
Others	0.001	(0.055)	-0.475**	(0.189)	-0.042	(0.055)
Deprivation index quintile (ref: 1st)		. ,		. ,		. ,
2nd	-0.007	(0.030)	-0.028	(0.058)	-0.013	(0.030)
3rd	-0.009	(0.033)	0.032	(0.061)	-0.002	(0.032)
$4\mathrm{th}$	-0.062**	(0.028)	-0.087	(0.055)	-0.078***	(0.028)
$5\mathrm{th}$	-0.064**	(0.026)	-0.132***	(0.050)	-0.089***	(0.025)
Screening profile (ref: Screened)						
Not screened	-1.747***	(0.020)	0.520^{***}	(0.047)	-1.657***	(0.020)
Refused	-0.966***	(0.042)	1.084^{***}	(0.067)	-0.739***	(0.042)
New eligible	-0.988***	(0.036)	0.528^{***}	(0.075)	-0.930***	(0.036)
New comers	-1.223***	(0.052)	0.727^{***}	(0.095)	-1.127***	(0.051)
Age group (ref: 50-54)						
[55-59]	-0.116***	(0.027)	-0.018	(0.053)	-0.109***	(0.027)
[60-64]	0.033	(0.029)	-0.030	(0.058)	0.033	(0.028)
[65-69]	0.009	(0.030)	0.033	(0.059)	0.026	(0.030)
[70-75]	-0.200***	(0.035)	0.069	(0.065)	-0.175***	(0.034)
Compl. Health Insu (ref: private)						
CMUC-ACS	-0.268***	(0.038)	-0.106	(0.075)	-0.282***	(0.037)
None	-0.199***	(0.028)	-0.000	(0.052)	-0.187***	(0.027)
Gynecologist visit (ref: 0)						
1	0.148^{***}	(0.031)	0.648^{***}	(0.047)	0.335^{***}	(0.031)
GP visits (ref: 0)						
[1-3]	0.269^{***}	(0.032)	0.182^{***}	(0.068)	0.285^{***}	(0.031)
[4-6]	0.352^{***}	(0.033)	0.184^{***}	(0.069)	0.365^{***}	(0.032)
>=7	0.441^{***}	(0.033)	0.201^{***}	(0.069)	0.454^{***}	(0.032)
Chronic disease (ref: No)						
Chronic disease	-0.216***	(0.022)	0.436^{***}	(0.039)	-0.112***	(0.021)
N.c.	0.190	(0.138)	0.047	(0.305)	0.181	(0.136)
Département (ref: Eure)						
Seine-Maritime	0.115^{***}	(0.019)	-0.067*	(0.037)	0.098***	(0.019)
Constant	0.599^{***}	(0.042)	-2.707***	(0.091)	0.585^{***}	(0.041)
Observations	26,495		26,495		26,495	

Table VI: Estimation of the average marginal effects of covariates on screening outcomes

Estimated with a probit model.

Appendix C Letters from the selection process



Grille d'évaluation des lettres :
Lisez et notez chacune des 5 lettres sur une échelle de 1 à 4.
 ⇒ 1 indique que ces lettres ne vous informent pas. ⇒ 4 indique que ces lettres vous informent complètement.
- Ces lettres vous informent-elles des raisons pour lesquelles vous êtes invités à vous faire dépister ?
Lettre 1 : 1 2 3 4 Sans opinion
Lettre 2 : 1 2 3 4 Sans opinion
Lettre 3 : 1 2 3 4 Sans opinion
Lettre 4 : 1 2 3 4 Sans opinion
Lettre 5 : 1 2 3 4 Sans opinion
- Ces lettres vous informent-elles des avantages que procure le dépistage organisé ?
Lettre 1 : 1 2 3 4 Sans opinion
Lettre 2 : 1 2 3 4 Sans opinion
Lettre 3 : 1 2 3 4 Sans opinion
Lettre 4 : 1 2 3 4 Sans opinion
Lettre 5 : 1 2 3 4 Sans opinion
- Ces lettres vous informent-elles sur ce qu'est une mammographie ?
Lettre 1 : 1 2 3 4 Sans opinion
Lettre 2 : 1 2 3 4 Sans opinion
Lettre 3 : 1 2 3 4 Sans opinion
Lettre 4 : 1 2 3 4 Sans opinion
Lettre 5 : 1 2 3 4 Sans opinion
- Ces lettres vous informent elles de la marche à suivre pour se faire dépister ?
Lettre 1 : 1 2 3 4 Sans opinion
Lettre 2 : 1 2 3 4 Sans opinion
Lettre 3 : 1 2 3 4 Sans opinion
Lettre 4 : 1 2 3 4 Sans opinion
Lettre 5 : 1 2 3 4 Sans opinion

Questionnaire
1. Dans quel département vivez-vous ?
2. Quelle est votre date de naissance ?
3 Avez vous déià effectué une mommographie ?
Oui, il y a moins de 2 ans Oui, il y a plus de 2 ans Non, jamais
4. Le français est-il votre langue maternelle ? Oui 🗌 Non 🗌
5. A quelle catégorie socio-professionnelle appartenez-vous ?
Agriculteurs exploitants Artisans, commerçants et chefs d'entreprise
Cadres et professions intellectuelles supérieures Professions Intermédiaires Employés
Ouvriers Chômeurs Retraités : Si oui, ancienne catégorie socio-professionnelle :
 Quel est le revenu net mensuel de votre ménage (c'est-à-dire dans votre foyer)? Par exemple : votre revenu plus celui de votre mari.
□ Entre 500 et 1000 € □ Entre 1001 et 1500 € □ Entre 1501 et 2000 € □ Entre 2001 et 2500 €
□ Entre 2501 et 3000 € □ Entre 3001 et 4000 € □ Entre 4000 et 4900 € □ 5000 € et plus
7. Quel est le plus haut diplôme que vous détenez ?
Aucun diplôme.
CEP (certificat d'études primaires) ou diplôme étranger de même niveau
Brevet des collèges, BEPC, brevet élémentaire ou diplôme étranger de même niveau
CAP, BEP ou diplôme de ce niveau
Baccalauréat technologique (séries ST2S, STI, STL, STG, anciennement F, G, H) professionnel ou diplôme de ce niveau dont BT et BTA
Baccalauréat général (séries ES, L, S ou anciennement A, B, C, D, E), brevet supérieur, capacité en droit, DAEU ou diplôme étranger de même niveau
Baccalauréat sans autre précision
Diplôme de niveau Bac+2 (1er cycle universitaire, Deug, BTS, DUT)
Diplôme de niveau Bac+3 (Licence)
Maîtrise, DESS, diplôme d'ingénieur, de grande école

LETTRE 5

Madame,

Au cours de sa vie près d'une femme sur huit sera confrontée à ce cancer qui met en général plusieurs années à se développer. Il est donc essentiel, dès 50 ans, de participer régulièrement au dépistage organisé afin de pouvoir traiter au plus vite d'éventuelles anomalies.

Le dépistage organisé est le seul dispositif où, pour plus de sécurité, les mammographies jugées normales sont systématiquement relues par un second radiologue.

La mammographie est prise en charge à 100% sans avance de frais. Si un examen complémentaire est nécessaire, comme une échographie par exemple, il sera pris en charge aux conditions habituelles par l'Assurance Maladie.

N'attendez pas, prenez rendez-vous avec l'un des radiologues de votre choix figurant dans la liste imprimée au verso. Lors de la consultation, pensez à apporter :

- Cette lettre
- Votre carte vitale
- Vos précédentes mammographies

Pour plus d'informations, consultez le dépliant ci-joint, adressez-vous à votre médecin ou contactez-nous au XX XX XX XX XX XX.

LETTRE 3

Madame,

Une campagne de dépistage systématique du cancer du sein par mammographie est organisée dans votre département et s'adresse aux femmes âgées de 50 à 74 ans.

Nous vous invitons à prendre rendez-vous chez un radiologue agréé (liste au verso) afin de passer une mammographie de dépistage prise en charge à 100% et sans avance de frais.

Le jour de l'examen, veuillez présenter :

- Ce bon de prise en charge
- Votre carte vitale et votre carte de mutuelle
- Ainsi que les précédentes mammographie et échographies

Vous pouvez rencontrer votre médecin traitant ou gynécologue à l'occasion d'une consultation. Il peut aussi vous remettre une fiche de l'association « *nom de l'association* » de prise en charge et vous expliquer l'intérêt du dépistage organisé.

Le médecin radiologue après examen vous donnera un premier résultat, votre dossier sera alors adressé à l'association « *nom de l'association* » pour une seconde lecture de sécurité.

Le résultat définitif et vos clichés vous seront envoyés directement par la poste après environ trois semaines. Votre médecin généraliste traitant et ou votre gynécologue seront aussi informés du résultat.

<u>LETTRE 1</u>

Madame,

Dans le cadre du dépistage organisé du cancer du sein, l'association « *nom de l'association* » en partenariat avec les Caisses d'Assurance Maladie et l'Agence Régionale de Santé – ARS- vous incite à réaliser une mammographie, tous les 2 ans, à partir de 50 ans.

Vous n'avez jamais passé de mammographie ou cet examen date de plus de 2 ans. Vous pouvez dès maintenant prendre rendez-vous pour un examen des seins chez un radiologue agréé de votre choix (liste des radiologues au dos).

Vous bénéficiez alors :

- D'une prise en charge à 100% sans avance de frais,
- D'une deuxième lecture des clichés considérés comme normaux

En choisissant le dépistage organisé, ce sont deux radiologues qui contrôlent la santé de vos seins !

Munissez-vous de votre carte vitale et de votre carte de mutuelle. Ramenez vos anciens clichés si vous en possédez.

Vous récupérerez votre examen et le compte rendu définitif, chez votre radiologue dans un délai de 3 semaines.

En espérant avoir retenu votre attention, veuillez recevoir, Madame, nos salutations respectueuses et dévouées.

LETTRE 4

Madame,

Savez-vous qu'il existe un dépistage organisé gratuit du cancer du sein pour toutes les femmes de 50 ans à 74 ans ?

La mammographie est une radiographie des seins.

Nous vous invitons à passer cet examen gratuit et fiable chez le radiologue agréé de votre choix (liste au dos). Pour plus de qualité, le dépistage organisé est le seul dispositif où, chaque mammographie jugée normale est relue par un second radiologue.

Le cancer du sein est fréquent, mais découvert tôt, il est plus facile à traiter.

Le jour de l'examen, veuillez présenter :

- Ce courrier
- Votre carte vitale et votre carte de mutuelle
- Vos anciennes mammographies si vous les avez.

Pour plus d'information et de conseil, n'hésitez pas à contacter votre médecin traitant ou à nous appeler au XXXXXXXX.

LETTRE 2

Madame,

Savez-vous qu'il existe un dépistage organisé gratuit du cancer du sein pour toutes les femmes de 50 ans à 74 ans ?

Pourquoi?

Le cancer du sein est fréquent, mais découvert tôt, il est plus facile à traiter. La mammographie est une radiographie des seins. C'est un examen gratuit et fiable.

Comment?

Prenez-rendez vous directement chez le radiologue agréé de votre choix (liste au dos). Le jour du rendez vous il vous suffit de vous présenter avec cette invitation, vos dernières radios et votre carte Vitale et carte de Mutuelle.

N'attendez plus !

Appendix D Treatments



Figure 5: Letter with the descriptive norm



Figure 6: Envelop for the logo treatment



337 rue Gay Lussac ZI de Nétreville 27000 EVREUX

tél : 02.27.34.10.00 fax. 02.27.34.10.01 e-mail : decad.e@magic.fr



Madame,

Au cours de sa vie près d'une femme sur huit sera confrontée à ce cancer qui met en général plusieurs années à se développer. Il est donc essentiel, dès 50 ans, de participer régulièrement au dépistage organisé afin de pouvoir traiter au plus vite d'éventuelles anomalies.

Le dépistage organisé est le seul dispositif où, pour plus de sécurité, les mammographies jugées normales sont systématiquement relues par un second radiologue.

La mammographie est prise en charge à 100% sans avance de frais. Si un examen complémentaire est nécessaire, comme une échographie par exemple, il sera pris en charge aux conditions habituelles par l'Assurance Maladie.

N'attendez pas, prenez rendez-vous avec l'un des radiologues de votre choix figurant dans la liste imprimée au verso. Lors de la consultation, pensez à apporter :

- Ce courrier
- Votre carte Vitale
- Vos précédentes mammographies

« En choisissant le Dépistage organisé, Ce sont deux radiologues qui contrôlent la santé de vos seins ! »

Pour plus d'informations, consultez le dépliant ci-joint, adressez-vous à votre médecin ou contactez nous au 02 27 34 10 00.

En espérant avoir retenu votre attention, veuillez recevoir, Madame, nos salutations respectueuses et dévouées.

DR GUILLER-DEVILLERS Sylvie

Veuillez compléter le coupon réponse et nous le renvoyer grâce à l'enveloppe « T » jointe, si vous êtes dans l'un des 3 cas suivants :

J'ai été opérée d'un cancer du sein le : / /

Nom et adresse du chirurgien : Dr



Ma dernière mammographie date de moins de 2 ans
 Date du dernier examen ____/____/_____
 Je ne souhaite pas bénéficier de cette invitation :

Je soussigné, Mme _____ refuse de participer à cette campagne de dépistage organisé du cancer du sein.

Vous pouvez à tout moment changer d'avis et nous demander une prise en charge par téléphone.

Signature obligatoire

_ à ___

Cette lettre d'invitation a été envoyée dans le cadre d'une expérimentation menée par DECAD'E. Dans le cadre de cette expérimentation, des informations complémentaires seront recherchées auprès de votre Caisse d'Assurance Maladie. En application de la loi « Informatique et Libertés » (article 15 alinéa 3 de la loi du 6 janvier 1978- modifiée en 2004) vous avez le droit d'accès aux informations vous concernant, que vous pouvez exercer auprès de l'association DECAD'E.

Figure 7: The INCA letter



Association pour le dépistage organisé des cancers en Seine-Maritime Association EMMA : Espace Claudie André-Deshays - 42, rue des Chouquettes - 76190 YVETOT Tél. 02 35 96 48 87 - Fax. 02 35 96 72 28

Bon de prise en charge



Madame,

Une campagne de dépistage systématique du cancer du sein par mammographie est organisée dans le département de la Seine-Maritime et s'adresse aux femmes âgées de 50 à 74 ans.

Nous vous invitons à prendre rendez vous chez un radiologue agréé (liste au verso) afin de passer une mammographie de dépistage prise en charge à 100 % et sans avance de frais.

Le jour de l'examen, veuillez présenter :

- ce bon de prise en charge,
- votre carte vitale et votre carte de mutuelle,
- ainsi que les précédentes mammographies et échographies.

Vous pouvez rencontrer votre médecin traitant ou gynécologue à l'occasion d'une consultation. Il peut aussi vous remettre une fiche EMMA de prise en charge et vous expliquer l'intérêt du dépistage organisé.

Le médecin radiologue après examen vous donnera un premier résultat, votre dossier sera alors adressé à l'Association EMMA pour une seconde lecture de sécurité.



Le résultat définitif et vos clichés vous seront envoyés directement par la poste après environ trois semaines. Votre médecin généraliste traitant et/ou votre gynécologue seront aussi informés du résultat.

Si vous ne souhaitez pas bénéficier de ce dépistage, merci de nous retourner ce bon de prise en charge complété ; vous éviterez ainsi une relance inutile.

Exclusion médicale (précisez)

Autre motif (précisez)

.....

.....

Veuillez agréer, Madame, Monsieur, l'expression de nos salutations les meilleures.

- Camies
- ☐ Je ne souhaite pas participer
- Antécédent de cancer du sein
- TAIRES, MILITA MBLÉES NATIO nsi que les mute MGEN, MG

Antecedent de cancer du sein	
Suivi pour une anomalie clinique	

Suivi pour une anomalie clinique
et / ou radiologique du sein

RÉSERVÉ AU RADIOLOGUE	RÉSERVÉ A LA FEMME
Cachet du radiologue	N° d'immatriculation :
	Régime d'assurance maladie :
Date :	□ Oui je souhaite participer
Signature :	Date :
	Signature :
Au dos de cette invitation : la liste des cabinets de radiologie agréés où vous pouvez prendre rendez-vous.	

Cette lettre d'invitation a été envoyée dans le cadre d'une expérimentation menée par EMMA. Dans le cadre de cette expérimentation, des informations complémentaires seront recherchées auprès de votre Caisse d'Assurance Maladie. En application de la loi « Informatique et Libertés » (articie 15 alinés 3 de la loi du 6 jauvier 1978- modifiée en 2004) vous avez le droit d'accés aux informations vous concernant, que vous pouvez exercer auprès de l'association EMMA.

Figure 8: Control group letter in *département* of Seine-Maritime