

**SUPPLEMENTARY MATERIAL (not for publication)**

**“COVID-19 information, demand and willingness to pay for protective gear in the UK”**

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**Section A. Statistical Inference and Sample Size**

**Section B. Information on the online survey and summary statistics**

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## Section A. Statistical Inference and Sample Size

Our main focus when designing our study was on the causal effect of information on the demand for hand sanitiser gel, disposable face masks and disposable gloves. For this reason, our sample size was based on minimum detectable effects for  $\beta_{1j}$  and  $\beta_{2j}$ . For a test with power of 80% this was computed following (Kondylis and Loeser, 2020):

$$MDE_{0.8} = 2.8\sigma \sqrt{\frac{1}{N_C} + \frac{1}{N_T}},$$

where  $N_C$  is the number of observations in the control group,  $N_T$  is the number of observations in the treatment group, and  $\sigma$  is the standard deviation of the main binary outcome of interest. In our pilot, the minimum standard deviation among the three main binary outcomes of interest (e.g. “Would you buy ...?”) was  $\sim 0.3$ . We expected to interview  $\sim 1,000$  respondents, split equally in each arm – T1 and T2 (treatment arms) and placebo (control arm)– and with a minimum number of 300 observations in each arm. This implies a minimum detectable effect (MDE) of

$$MDE_{0.8} \approx 0.07.$$

This was deemed as a reasonable MDE, since in the pilot the point estimates of the effects (T2 against T1) for the three relevant outcomes ranged from 0.11 to 0.18.<sup>1</sup>

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<sup>1</sup> In the pilot we compared *different* treatments without a pure placebo.

## Section B. Information on the online survey and summary statistics

We launched an *online* survey (containing an experiment) in [Prolific](#) on a representative sample of the UK general population by age, sex and ethnicity on 11 April 2020. Prolific allows for the possibility of obtaining representative samples by cross-stratifying on sex (male or female), age (18-27, 28-37, 38-47, 48-57, or 58+) and ethnicity (Asian, Black, Mixed, Other, or White).

The survey was launched at 9:59 am (GMT+1) and announced with the title “DDCO Survey” and the following brief summary: *This study is conducted by researchers from the University of Exeter. Participants will be asked to answer a set of questions on demographic patterns. This includes questions that may be sensitive, including but not limited to questions related to Coronavirus.*

In the pre-analysis plan pre-registered in [AsPredicted](#) (#38962) on 10 April 2020, we stated that our target sample was 1,000 respondents and that we would exclude (1) participants who gave a different answer to the education question (asked twice in the survey), (2) participants who completed the survey in less than 2 minutes, and (3) participants whose reported sex was different from either female or male. We collected information on 999 uniquely identified respondents. After applying the exclusion rules, we were left with a final working sample of 949 respondents.<sup>2</sup>

Prolific is an online platform collection that connects researchers with participants around the world, who get paid cash for taking part in research. 40% of their pool of participants are UK residents. We paid £1.25 per completed survey, and the average survey completion time was about 8 minutes,<sup>3</sup> so that the expected reward per hour was £9.37 per hour.<sup>4</sup>

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<sup>2</sup> The only binding exclusion rule was the education one: 50 respondents provided a different answer to the education question at different times during the survey.

<sup>3</sup> The average completion time was 7.71 minutes.

<sup>4</sup> Researchers are asked to reward participants with at least \$6.50 per hour.

**Table S1. Summary statistics.**

	Mean	SD	Min	Max
Female	0.508	--	0	1
Age	46.68	15.52	19	88
White	0.847	--	0	1
University	0.529	--	0	1
Total income (£ before tax) in 2019	25,767	11,706	15,000	50,000
Hand sanitizer at home	0.729	--	0	1
Disposable face masks at home	0.262	--	0	1
Disposable gloves at home	0.566	--	0	1
Price of hand sanitiser (£)	10.63	8.80	2	24
Price of disposable face masks (£)	11.66	8.83	3	26
Price of disposable gloves (£)	14.90	10.77	4	32
Stated demand for hand sanitiser	0.238	--	0	1
Stated demand for disposable face masks	0.326	--	0	1
Stated demand for disposable gloves	0.326	--	0	1

Note: Number of observations is 949.

### Section C. Estimated Demands with control variables

Table S2 reports estimated demand curves after adding a vector of control variables: *standard socioeconomic characteristics* (sex (female = 1 if female, = 0 if male), age (2020 – year of birth), ethnicity (white = 1 if white, white = 0 else), 11 regional dummies,<sup>5</sup> marital status (partnered = 1 if married or cohabiting, = 0 else), household size, education (university = 1 if university, = 0 else), and income (= log of income)), and an indicator of whether the individual has at home the product being demanded {hand sanitiser gel, disposable face masks, disposable gloves}.

<sup>5</sup> East Midlands, East of England, London, North East, North West, Northern Ireland, Scotland, South East, South West, Wales, and West Midlands

**Table S2. Estimated Demands with control variables.**

	Linear Probability Model			Logit Model		
	Hand sanitiser	Face masks	Gloves	Hand Sanitiser	Face masks	Gloves
Price	-0.023*** (0.002)	-0.018*** (0.002)	-0.018*** (0.002)	-0.521*** (0.088)	-0.156*** (0.029)	-0.153*** (0.024)
Control variables	YES	YES	YES	YES	YES	YES
Test of all controls = 0 {p-value}	0.69 {0.8334}	2.21 {0.0030}	2.80 {0.0001}	14.68 {0.6837}	23.91 {0.1997}	29.49 {0.0427}
Observations	316	316	316	313	316	313

Note: Linear probability model (LPM) is estimated with robust standard errors. Test of all controls = 0: it reports the value of the F-statistic that all coefficients on the control variables in the LPM are zero (F(19,295)); it reports the value of the  $\chi^2$ -statistic that all coefficients on the control variables in the Logit model are zero ( $\chi^2(18)$  in columns 1 and 3, and  $\chi^2(19)$  in column 2). \*\*\* p<0.01, \*\* p<0.05.

#### Section D. Estimated WTP by sex

**Table S3. Estimated Willingness to Pay by sex.**

	Linear Probability Model		Logit Model	
	Men	Women	Men	Women
Hand sanitiser	5.02*** [3.74, 6.29]	5.17*** [3.94, 6.40]	2.96*** [2.01, 3.91]	2.98*** [1.98, 3.98]
Face masks	5.44*** [3.64, 7.24]	6.62*** [5.05, 8.19]	-0.750 [-10.87, 9.37]	3.57** [0.622, 6.53]
Gloves	9.44*** [7.33, 11.55]	9.04*** [7.18, 10.90]	5.25** [1.22, 9.29]	6.42*** [3.94, 8.89]

Note: Standard errors for WTP estimates (LPM and Logit) are bootstrapped (1,000 replications). 95% confidence intervals are reported in brackets. \*\*\* p<0.01, \*\* p<0.05.

## Section E. Last screen of the survey

Figure S1. Last screen of the survey



Thank you for your participation!

To prove that you have completed our survey, please follow this link:

<https://app.prolific.co/submissions/complete?cc=128C3B33>

### **Spread of Coronavirus in the UK**

As of 9am on 10 April:

- A total of **256,605** people have been **tested** for Coronavirus.

As of 5pm on 9 April:

- Of those hospitalised who tested positive for Coronavirus, **8,958** have sadly **died**.

### **Advice for everyone: stay at home**

For advice RE Coronavirus, visit the NHS webpage: <https://www.nhs.uk>

### **Struggling with stress, anxiety or depression?**

If you're struggling with stress, anxiety or depression, it's best to speak to someone:

You can call Samaritans free on **116 123** if you want to talk to someone now.

## Section F. Randomisation check

Table S4 display the average characteristics of our respondents across arms, individual tests for differences across arms, and an omnibus test based on a multinomial logit where we test whether pre-treatment individual characteristics predict participation in any particular arm (control, T1, and T2).

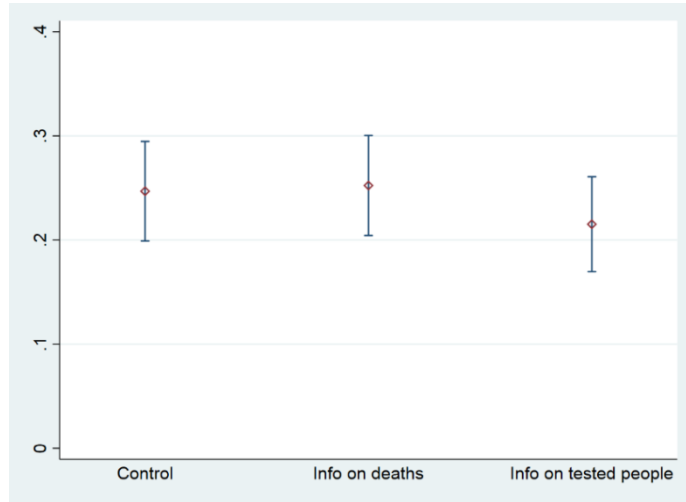
**Table S4. Means of pre-treatment characteristics by treatment arm.**

Individual tests	Means			Test of equality of means		
	C	T1	T2	C = T1 <i>p-value</i>	C = T2 <i>p-value</i>	C = T1 = T2 <i>p-value</i>
<i>Actual demands</i>						
Hand sanitiser gel	0.73	0.71	0.75	0.596	0.512	0.492
Disposable face masks	0.28	0.24	0.27	0.275	0.981	0.454
Disposable gloves	0.62	0.54	0.54	0.044	0.032	0.054
<i>Demographics</i>						
Female	0.52	0.52	0.49	1.000	0.551	0.789
Age	47.02	46.45	46.59	0.649	0.729	0.893
White	0.86	0.84	0.84	0.317	0.442	0.572
<i>Region or nation</i>						
East Midlands	0.07	0.06	0.07	0.629	0.886	0.802
East of England	0.06	0.05	0.07	0.592	0.628	0.592
London	0.14	0.13	0.15	0.643	0.923	0.834
North East	0.03	0.06	0.02	0.030	0.398	0.014
North West	0.16	0.12	0.12	0.134	0.164	0.260
Northern Ireland	0.01	0.01	0.01	0.704	0.707	0.905
Scotland	0.09	0.09	0.04	0.783	0.004	0.003
South East	0.13	0.16	0.18	0.363	0.065	0.182
South West	0.10	0.09	0.11	0.593	0.908	0.783
Wales	0.03	0.04	0.06	0.678	0.137	0.323
West Midlands	0.10	0.09	0.11	0.789	0.806	0.876
Living with a partner	0.63	0.61	0.63	0.567	0.910	0.764
Household size	2.77	2.72	2.67	0.598	0.338	0.632
University	0.52	0.54	0.52	0.577	0.967	0.799
Log(income)	10.05	10.06	10.08	0.784	0.291	0.547
<i>Prices</i>						
Price of hand sanitiser	10.33	11.25	11.30	0.190	0.962	0.307
Price of face masks	11.23	11.49	12.25	0.713	0.147	0.330
Price of gloves	14.37	15.58	14.76	0.161	0.641	0.360
Observations	316	316	317			
<b>Omnibus test</b>				$\chi^2(48) = 50.95$ p-value = 0.3585		

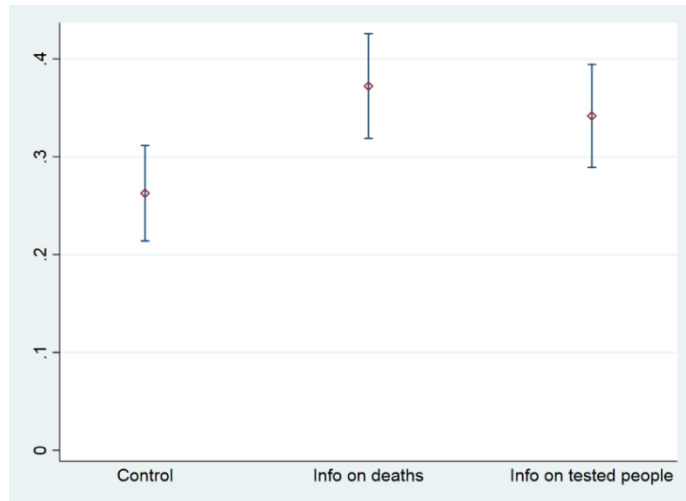
Note: Test of equality of means is obtained from an OLS regression on the corresponding variable on a constant, T1 and T2, with robust standard errors. The column for “test for C = T1” displays the p-value of the t-test that the coefficient on T1 is zero; the column for “test for C = T2” displays the p-value of the t-test that the coefficient on T2 is zero; the column for “test for C = T1 = T2” displays the p-value of the F-test that the coefficients on T1 and T2 are both zero. The Omnibus test: test that all the coefficients of a multinomial logit of participation in an arm (probability of participating in each arm) on the pre-treatment characteristics are zero.

**Section G. Visual representation of treatment effects on demands**

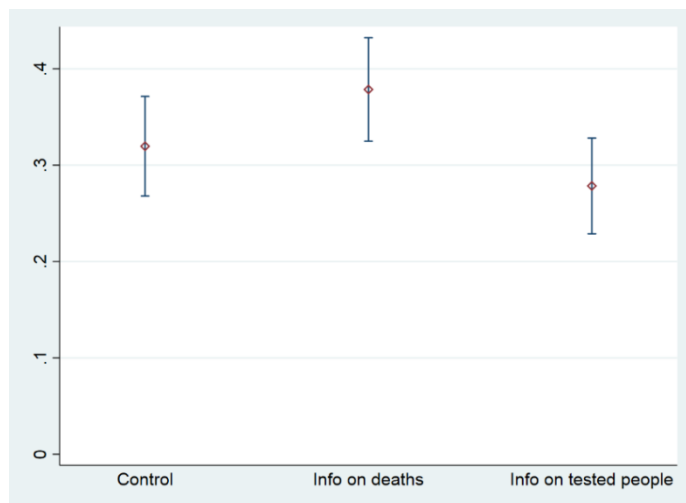
**Figure S2. Stated demand for hand sanitiser gel. Mean and 95% CI by treatment arm.**



**Figure S3. Stated demand for disposable face masks. Mean and 95% CI by treatment arm.**



**Figure S4. Stated demand for disposable gloves. Mean and 95% CI by treatment arm.**



**Section H. Robustness check: estimating treatment effects with a Logit model**

**Table S5. Average treatment effects of information using a Logit probability model.**

	Hand Sanitiser	Face Mask	Gloves
T1	-0.032 (0.034) [-0.099, 0.035]	0.082** (0.038) [0.008, 0.156]	-0.043 (0.038) [-0.117, 0.031]
T2	0.005 (0.033) [-0.060, 0.071]	0.111*** (0.037) [0.038, 0.183]	0.057 (0.036) [-0.014, 0.128]
Observations	949	949	949

Note: Delta-method standard errors in parentheses. 95% CI in brackets. \*\*\* p<0.01, \*\* p<0.05.

Section I. Non-parametric analysis of treatment effects

Figure S5. Non-parametric stated demand for hand sanitiser gel by treatment arm.

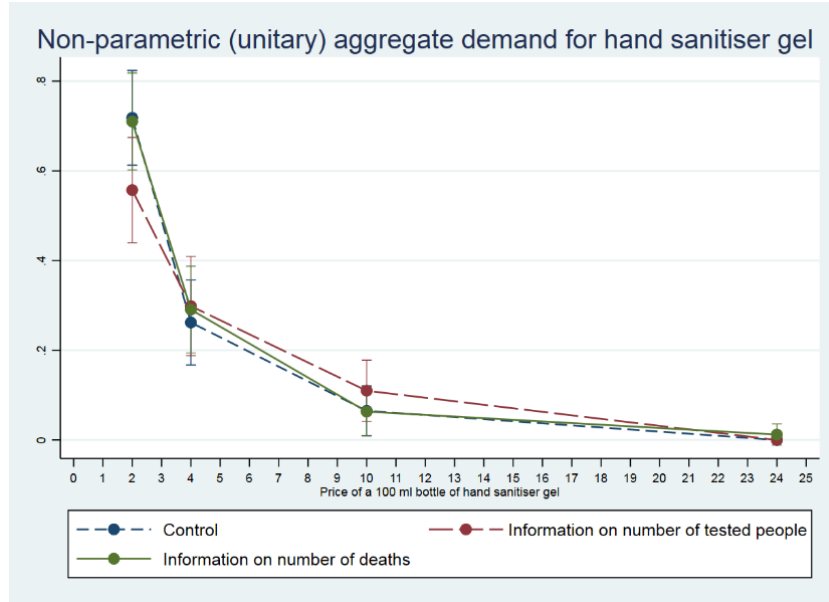
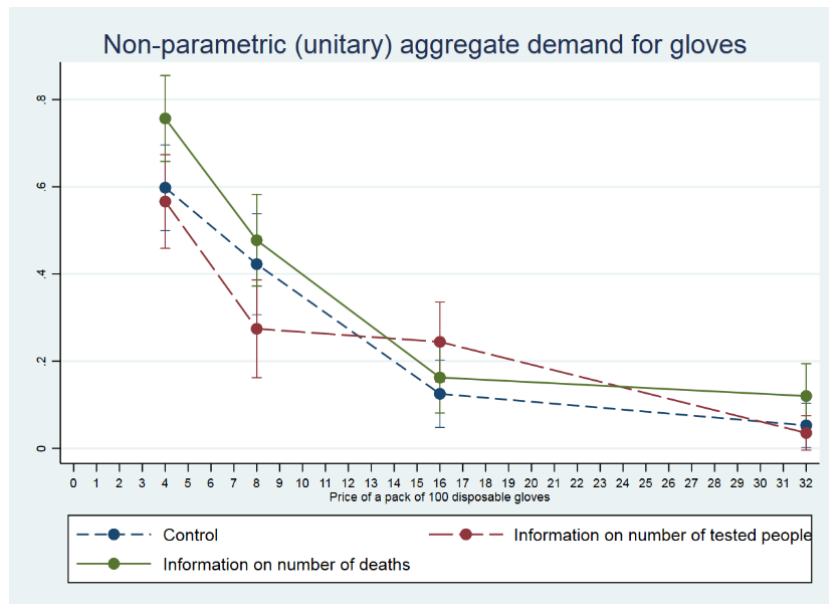


Figure S6. Non-parametric stated demand for disposable gloves by treatment arm.



## Section J. Secondary hypothesis: the effect of information on demands by sex

### J.1. Parametric analysis

*Identification.* We proceed by adding an indicator variable for female,  $F_i$ , and the interactions of the treatment indicators with  $F_i$  to equation (5):

$$Y_{ij} = \alpha_j + \beta_{1j}T_{1i} + \beta_{2j}T_{2i} + \gamma_j F_i + \delta_{1j}T_{1i}F_i + \delta_{2j}T_{2i}F_i + v_{ij}, \quad (J1)$$

where  $F_i = 1$  if individual  $i$  is a female,  $= 0$  if individual  $i$  is a male. The parameter  $\delta_{1j}$  (resp.  $\delta_{2j}$ ) measures whether the causal effect of T1 (resp. T2) on  $Y_{ij}$  differs by sex.

*Testing.* We estimate standard errors robust to heteroskedasticity and test the following hypotheses:

- $\delta_{1j} = 0$  against  $\delta_{1j} \neq 0$ ;
- $\delta_{2j} = 0$  against  $\delta_{2j} \neq 0$ .

*Findings.* The estimates and tests of (J1) are reported in Table A6. We do not find evidence of heterogeneous effects by sex.

**Table S6. OLS regressions of hand sanitiser, face masks or gloves on T1, T2, female and interactions.**

	Hand Sanitiser	Face Mask	Gloves
T1	-0.046 (0.047)	0.026 (0.050)	-0.026 (0.053)
T2	0.032 (0.049)	0.106** (0.051)	0.059 (0.054)
Female	0.022 (0.049)	0.040 (0.050)	0.011 (0.053)
T1 × Female	0.027 (0.067)	0.103 (0.072)	-0.029 (0.073)
T2 × Female	-0.052 (0.069)	0.009 (0.074)	0.001 (0.076)
Mean Control	0.235*** (0.034)	0.242*** (0.035)	0.314*** (0.038)
Observations	949	949	949

Note: Robust standard errors in parentheses. Each column displays a regression of an indicator of whether the individual would buy a 100ml bottle of hand sanitiser, a pack of 10 disposable face masks, or a pack of 100 disposable gloves on a constant, two treatment indicators (T1 and T2), a female indicator, and the interactions of the previous indicators. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ .

## J.2. Non-parametric analysis

Figure S7. Non-parametric stated demand for hand sanitiser gel by treatment arm and sex.

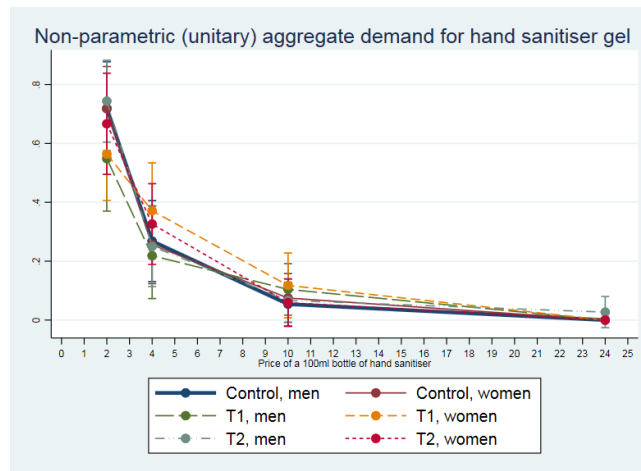


Figure S8. Non-parametric stated demand for disposable face masks by treatment arm and sex.

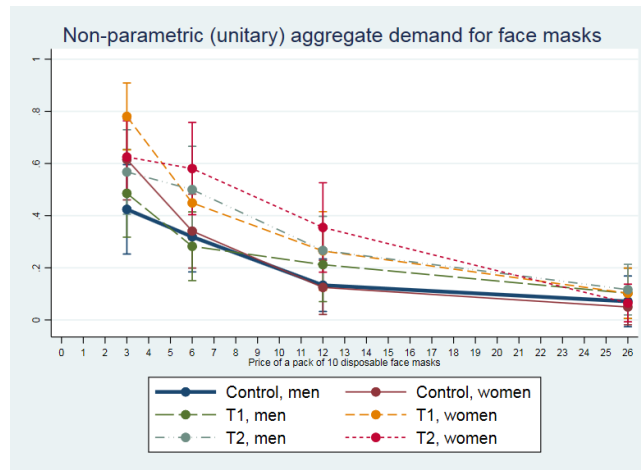
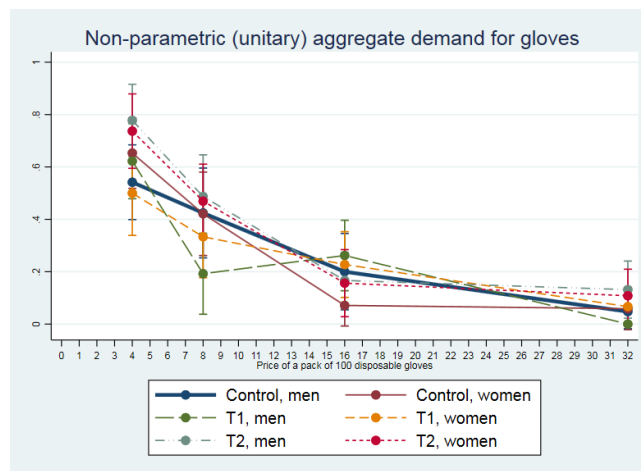


Figure S9. Non-parametric stated demand for disposable gloves by treatment arm and sex.



## **Section K. Information and Donations**

We report in this section the findings of our investigation on whether the provision of information affects donations to Age UK, British Lung Foundation, Samaritans, and Women’s Aid, following our pre-registered plan of analysis. These UK charities focus on elderly people, people suffering from lung/respiratory diseases, people struggling with mental health, and women who are victims of domestic violence. These are four vulnerable groups affected directly (e.g. via a weaker immune system) and/or indirectly (e.g. via lockdown measures) by the COVID-19 pandemic.

At the end of the survey, participants were given the option to ask us to donate up to 50p to a UK charity. Participants might donate the whole 50p, part of it, or none to any of four UK charities: AGE UK, British Lung Foundation (BLF), Samaritans and Women’s Aid.<sup>6</sup> Respondents were not allowed to keep the amount not donated.

We decided to select these four charities to measure the strength of the (revealed) relative preference for “helping elderly people” (as captured by the donation to AGE UK), for “helping people suffering from lung/respiratory diseases” (donation to BLF), for “helping people struggling with mental health issues” (donation to Samaritans), and for “helping women who are victims of domestic violence” (donation to Women’s Aid). Nothing donated to any of them would represent no preference for supporting any of these charities.

Elderly people, people suffering from lung/respiratory diseases, people struggling with mental health, and women who are victims of domestic violence are four vulnerable groups affected directly (e.g. via a weaker immune system) and/or indirectly (e.g. via lockdown measures) by the COVID-19 pandemic. Stronger or weaker preferences for supporting these charities (and ultimately their targeted groups) might vary for different reasons. One of the potential reasons is that, *ceteris paribus*, the problems these charities try to address may vary on how visibly-related to the COVID-19 pandemic they are (see the VOX video on the politics of visibility by Ray (2020): <https://voxeu.org/content/covid-19-politics-visibility>).

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<sup>6</sup> Participants were asked to allocate the 50p among these four charities and “Amount not to be donated”.

The charity with the *highest* average donation per participant is Age UK (12.15 p) and the one with the *smallest* average donation per participant is Women’s Aid (8.51 p).<sup>7</sup> Donations to the UK charities were implemented on 20 April 2020.<sup>8</sup>

Our investigation on whether the provision of information affects donations to UK charities focusing on COVID-19 vulnerable groups (Age UK, British Lung Foundation, Samaritans, and Women’s Aid) reveals no statistically significant effect. However, we acknowledge that the estimated effects on donations are not precisely estimated.

### **K.1. Main hypothesis: the causal effect of information on donations**

The main hypothesis is that the provision of information on either coronavirus tested people or coronavirus deaths increases the donations for {AGE UK, the British Lung Foundation, Samaritans, Women’s Aid}, but that the informational treatments have different effects. These charities all focus on issues that are more or less visibly related to the COVID-19 crisis.

We follow the same identification and testing approach as in Section 4. In Table S7 we estimate the same type of regression as in (6) but replacing the dependent variable  $Y_{ij}$  with  $D_{ij}$ , which is the fraction (0-1) out of 50p donated to the UK charity  $j$ , where  $j = \{\text{AGE UK, the British Lung Foundation, Samaritans, Women’s Aid}\}$ .<sup>9</sup> None of the point estimates is statistically significant at the 5% level, and their magnitudes fluctuate between  $-0.05$  and  $0.04$ . These can be interpreted as differences in percentage points over the mean in the control group, and can be quite large. For example, the point estimate of the average causal effect of T2 on donations to Samaritans suggests an effect of 23% of the mean. However, none of the estimates is precisely estimated, with quite wide confidence intervals (e.g.  $[-0.072, 0.031]$ ). Moreover, we cannot reject that all the treatment effects are simultaneously zero ( $\chi^2(8) = 8.58$ , p-value = 0.3787).

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<sup>7</sup> The average “no donation” is 8.95 p.

<sup>8</sup> £115 were donated to Age UK, £104 were donated to the British Lung Foundation, £90 were donated to Samaritans, and £81 were donated to Women’s Aid.

<sup>9</sup> Note that the sum of  $D_{ij}$  over  $j$  needs not be equal 1, since any individual  $i$  might decide to leave any “Amount not to be donated.”

**Table S7. OLS regressions of fraction donated to Age UK, BLF, Samaritans, Women's Aid or None on T1 and T2.**

	Age UK	BLF	Samaritans	Women's Aid	None
T1	0.016 (0.027) [-0.037, 0.068]	-0.021 (0.026) [-0.072, 0.031]	0.018 (0.023) [-0.027, 0.064]	0.029 (0.023) [-0.015, 0.074]	-0.043 (0.029) [-0.100, 0.015]
T2	0.016 (0.027) [-0.037, 0.068]	-0.049 (0.026) [-0.099, 0.001]	0.039 (0.024) [-0.008, 0.085]	0.023 (0.023) [-0.021, 0.068]	-0.029 (0.030) [-0.087, 0.030]
Mean control	0.233*** (0.019) [0.196, 0.269]	0.242*** (0.020) [0.204, 0.281]	0.170*** (0.016) [0.139, 0.200]	0.153*** (0.015) [0.123, 0.182]	0.203*** (0.022) [0.160, 0.246]
<b>F tests: F-statistic {p-values}</b>					
No treatment effect	0.23 {0.7960}	1.88 {0.1528}	1.34 {0.2621}	0.97 {0.3786}	1.07 {0.3438}
Same treatment effect	0.00 {0.9996}	1.36 {0.2439}	0.68 {0.4104}	0.06 {0.7992}	0.24 {0.6213}
Observations	945	945	945	945	945

Note: Robust standard errors in parentheses. Each column displays a regression of fraction donated on a constant, and the two informational treatment indicators (T1 and T2). 95% confidence intervals are reported in brackets. \*\*\* p<0.01, \*\* p<0.05.

For completeness, in Table S8, we estimate the average treatment effects of information on the fraction donated to the UK charities using a fractional Logit model. Not surprisingly, we obtain virtually the same estimates and very similar standard errors.

**Table S8. Average treatment effects of information using a Fractional Logit model.**

	Age UK	BLF	Samaritans	Women's Aid	None
T1	0.016 (0.027) [-0.037, 0.068]	-0.020 (0.025) [-0.069, 0.030]	0.019 (0.024) [-0.028, 0.066]	0.030 (0.023) [-0.015, 0.075]	-0.042 (0.029) [-0.099, 0.015]
T2	0.016 (0.027) [-0.037, 0.068]	-0.049 (0.026) [-0.100, 0.001]	0.039 (0.024) [-0.008, 0.085]	0.024 (0.023) [-0.021, 0.070]	-0.027 (0.029) [-0.084, 0.029]
Observations	945	945	945	945	945

Note: Delta-method standard errors in parentheses. 95% CI in brackets. \*\*\* p<0.01, \*\* p<0.05.

## K.2. Secondary hypothesis: the effect of information on donations by sex

We have also investigated whether the effects of delivering information on donations vary by sex, but failed to find evidence that this is the case. The estimates are reported in Table S9 below. We follow the same approach as in Section J.1 but replacing  $Y_{ij}$  with  $D_{ij}$ .

**Table S9. OLS regressions of fraction donated to Age UK, BLF, Samaritans, Women’s Aid or None on T1, T2, female and interactions.**

	Age UK	BLF	Samaritans	Women’s Aid	None
T1	0.026 (0.038)	-0.009 (0.039)	0.050 (0.035)	0.013 (0.024)	-0.081 (0.042)
T2	0.025 (0.038)	-0.063 (0.037)	0.049 (0.035)	0.003 (0.022)	-0.014 (0.045)
Female	-0.001 (0.037)	-0.025 (0.039)	-0.015 (0.031)	0.098*** (0.030)	-0.057 (0.044)
T1 × Female	-0.021 (0.053)	-0.023 (0.053)	-0.062 (0.047)	0.032 (0.044)	0.074 (0.059)
T2 × Female	-0.019 (0.054)	0.028 (0.051)	-0.023 (0.047)	0.046 (0.044)	-0.032 (0.059)
Mean control	0.233*** (0.027)	0.255*** (0.028)	0.177*** (0.023)	0.102*** (0.016)	0.232*** (0.032)
Observations	945	945	945	945	945

Note: Robust standard errors in parentheses. Each column displays a regression of the fraction donated on a constant, two treatment indicators (T1 and T2), a female indicator, and the interactions of the previous indicators. \*\*\* p<0.01, \*\* p<0.05.

## References

Kondylis, F. and J. Loeser. (2020) “Back-of-the-envelope power calcs.” *Development Impact World*

*Bank Blog*: <https://blogs.worldbank.org/impactevaluations/back-envelope-power-calcs>

Ray, D. (2020) COVID-19: The Politics of Visibility: <https://voxeu.org/content/covid-19-politics-visibility>