EQUALITAS
Economics of Inequality and Poverty Analysis

EQUALITAS Working Paper No. 79

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May, 2023

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Cognition and health-distribution preferences

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We analyse individuals' preferences vaccine-distribution schemes in the World, the EU, and their country of residence that emphasise circumstances rather than outcomes or effort. We link preferences to previously-measured cognition, and find that high-cognition individuals are 35% more likely to always support such schemes. These preferences are not driven by scheme convenience nor vaccine hesitancy, but appear to be caused by prosociality. We argue that this latter is linked to the perception of less equality of opportunity in society: despite having similar ideals about the role that effort and luck should play in life, high-cognition individuals perceive outcomes to be more determined by luck.

JEL-Classification: I14, D91, D71

Keywords: Social preferences, Redistribution, COVID-19, Vaccines, Cognition, COME-HERE survey.

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[*]The analysis in this article is part of a larger project on COVID-19 and inequalities. We are very grateful to Andrew Clark for comments and help. We also thank Alessia Casamassima, Kenneth Castillo-Hidalgo, David Castells-Quintana, and Enza Simeone for helpful suggestions. All remaining errors are our own. Financial support from the André Losch Fondation, Art2Cure, Cargolux, CINVEN Fondation and COVID-19 Foundation, under the aegis of the Fondation de Luxembourg, and the Fonds National de la Recherche Luxembourg (Grant 14840950 – COME-HERE) is gratefully acknowledged. Ada Ferrer-i-Carbonell acknowledges financial support through grant PID2020-114251GB-I00 funded by MCIN/ AEI /10.13039/50110001103, Severo Ochoa Programme for Centres of Excellence in RD (CEX2019-000915-S), and Generalitat de Catalunya (2021SGR00416). Xavier Ramos acknowledges financial support through grant PID2019-104619RB-C43 (Spanish Ministerio de Ciencia e Innovación). Brun: Universitat Autònoma de Barcelona, and EQUALITAS. D'Ambrosio: Université du Luxembourg. Ferrer-i-Carbonell: Institut d'Anàlisi Econòmica (CSIC), BSE, IZA, INSIDE, and MOVE. Ramos: Universitat Autònoma de Barcelona, IZA, and EQUALITAS. Corresponding author e-mail: martin.brun@uab.cat.

1 — Introduction

There is a large literature on the determinants of preferences for redistribution (Alesina and Giuliano, 2011), distinguishing these by individual characteristics. This literature has considered individual education, but rarely the role of cognitive abilities. On the one hand, Mollerstrom and Seim (2014) find, using Swedish data that higher cognition individuals show a lower propensity to redistribute, and argue that this is due to their higher income and assigning larger role to effort than luck. On the other hand, Brun and Ramos (2023) show that individuals with greater cognitive abilities are more supportive for income redistribution, which is argued to be related to pro-social preferences. We here contribute to this scarce literature, and analyse the preferences for health distribution of higher-ability individuals. Focusing on the latter is of interest, as they are better informed about the political discussions in society (Cassel and Lo, 1997), have greater access to leadership positions (Dal Bó et al., 2017), and vote more often in elections (Deary et al., 2008). We show that other-regarding preferences can explain differences in preferred health distributions,[1] and provide estimates for high-cognition individuals that plausibly establish an upper bound for the impact of cognition on distributional preferences.[2]

Our work also contributes to the exploration of fairness views as determinants of redistributive-policy preferences (in the line with Piketty, 1995; Alesina and Angeletos, 2005; Benabou and Tirole, 2006). We add to this literature showing that perceptions of equality of opportunity play a role in support for distributive policies (Alesina and Fuchs-Schuendeln, 2007; Durante et al., 2014; Almås et al., 2020), even when the role of effort in determining outcomes is similar across groups. These results stress the importance of perceived actual fairness in addition to normative fairness ideals.[3]

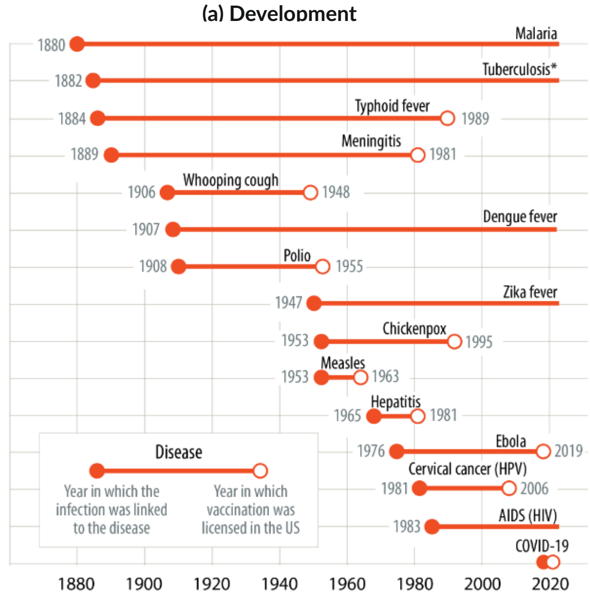
This paper contributes also to the inequality literature by documenting individuals' preferences for health redistribution in a context in which fairness and equality issues were very salient: the period when COVID-19 vaccines were developed and started to be commercialised. By the end of 2020, many pharmaceutical companies were requesting authorisations to start delivering vaccines to tackle the disease (see Figure 1a for a timeline of COVID-19 vaccine development). The imminent arrival of initially-limited vaccines sparked heated discussions about recipients who should have priority. Those discussions involved many concerns that are closely related to those that lie behind attitudes to income redistribution. The few papers that have examined the impact of the COVID-19 pandemic on social preferences find mixed results. While there are some positive effects in Shachat et al. (2021); Grimalda et al. (2021); Alsharawy et al. (2021), on others they are negative (Brañas-Garza et al., 2022; Buso et al., 2020), or zero (Casoria et al., 2023; Lohmann et al., 2023). None of this previous work, however, has considered how these preferences

[1] In line with recent finding concerning income, such as Tyran and Sausgruber (2006); Durante et al. (2014); Almås et al. (2020); Kerschbamer and Müller (2020); Fehr et al. (2022)

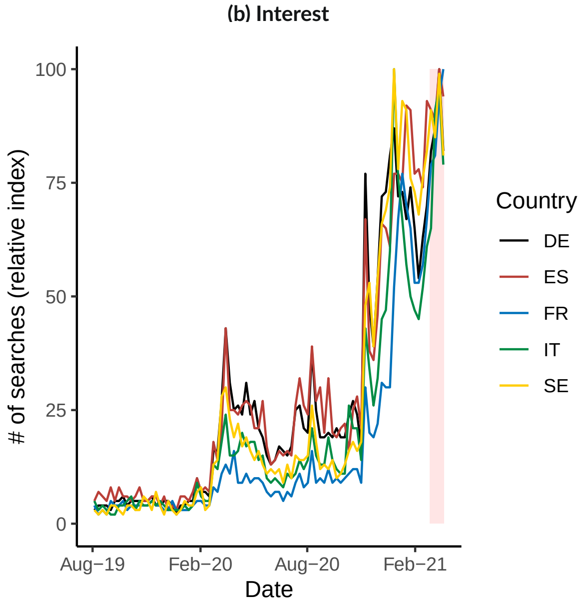
[2] Our data was collected in a context where a salient health issue (COVID-19) was very-much perceived to be determined by circumstances (rather than effort). In that sense, our findings relate to the role of circumstances in a salient period of time and over a salient issue.

[3] Understanding whether perceptions of unfairness affect desired fairness has also been analysed in political science and social psychology, although the results remain inconclusive. García-Castro et al. (2020) and Kuhn (2019) find that perceived inequalities reduce tolerance to inequality. In turn, García-Sánchez et al. (2018) and Trump (2018) find that they affect ideal views about inequality, driving higher tolerance for inequality in more-unequal societies.

Figure 1 — COVID-19 vaccines in context



Source: Stanley, A. (2021). The journey of the COVID-19 vaccine. International Monetary Fund. Based on data from Our World in Data. *Notes*: This figure plots years in which diseases were discovered and in which vaccination was licensed in the United States. The Hepatitis vaccine in the charts is for Hepatitis B. Vaccines for Tuberculosis and Dengue exist, but are not fully effective in adults.



Source: Google Trends. *Notes*: This figure plots relative interest in vaccines as proxied by Google searches for 'vaccine' in France, Germany, Italy, Spain, and Sweden between June 2019 and April 2021. The red bar indicates the days when the data on preferences for vaccine distribution were collected.

change by cognitive ability.

We use data from five European countries in which individuals were asked to report their preferences on how to distribute the COVID-19 vaccines across the World, the European Union (EU) and within their own country of residence. The data was collected in March 2021, a time when vaccines were scarce and policy makers had to decide who to vaccine first when using their share of vaccines purchased centrally by the European Commission. This health-distribution decision was apparent to all, in particular in terms of the the discussion about how many vaccines each EU country would receive, and who should be vaccinated first. These subjects appeared every day in the news and were widely-debated among the general public. This debate offers a unique context in which to understand what drives individual preferences for the 'distribution of health'.

The COVID-19 vaccine distribution is in itself a form of redistribution: vaccines are freely distributed in the population, and are financed by the Government's budget (to which some individuals contribute more than others). The order of vaccination is also a form of redistribution. Vaccination provides valuable protection against illness and, later on, greater access to transport and services. COVID-19 vaccines not only reduced severe health complications, they also prevented deaths (Watson et al., 2022; Polack et al., 2020; Baden et al., 2020; Voysey et al., 2021; Sadoff et al., 2021). As such, similarly to preferences for income redistribution, attitudes to COVID-19 vaccination distribution reflect views about solidarity (Cappelen et al., 2021), fairness (Fehr et al., 2022), risk aversion (Rehm, 2009; Gärtner et al., 2017), and self-interest (Meltzer and Richard, 1981; Benabou and Ok, 2001; Alesina and Giuliano, 2011). The first of these was particularly relevant at the time, with widespread calls for solidarity from influential sources (e.g., Guterres, 2020).

The majority of individuals in our survey countries viewed vaccines as providing substantial protection against disease. Vaccines are thus a clear example of what researchers would define to be a *merit good*.[4] We consider that distributional preferences for this type of goods provide information about other situations of interest, such as economic crises in general and natural disasters. Most importantly, they provide an upper bound for distributional preferences determined by fairness considerations, as they are measured in a context where both the exogeneity of the situation and the perception of vaccines as a good is broadly shared.

Our empirical analysis focuses on the comparison of the preferences for vaccine distribution declared by individuals with higher and lower cognitive abilities. We take advantage of the unique longitudinal and high-frequency information from the COME-HERE survey covering five European countries (France, Germany, Italy, Spain, and Sweden: see below for details). The wide variety of information in the survey allows us to control for individual characteristics other than cognition that might lie behind the correlation.

Opinions on vaccine distribution for the World, the EU, and across individuals within their country of residence were collected in March 2021, when vaccine-distribution schemes were hotly debated (see Figure 1b).

The questions were designed to distinguish schemes based on circumstances from those based on efforts.[5] In particular, the questions allow us to evaluate the prevalence of preferences for distributional schemes that prioritize circumstances (i.e, the vulnerability of the population) versus those that value effort more (i.e., taking preventive measures to reduce the spread of the virus). Around 34% of individuals prioritized circumstances in all three vaccine questions, and for high-cognition individuals this figure is 10.4 percentage points (p.p.) higher.

Cognition was measured seven months before vaccine opinions, in August 2020, through a Cognitive Reflection Test (CRT) that assesses the type of cognitive ability that relies on deliberate and conscious thought (Frederick, 2005). The test consists of 3 questions, all of which have an intuitive, but incorrect, response. The correct responses require some judgement. CRT test results are consistently correlated with those from other more complete-tests of cognitive ability (Frederick, 2005; Brañas Garza et al., 2012), and are predictive of decision making, such as strategic sophistication (Besedeš et al., 2012; Carpenter et al., 2013) and behavioral biases (Oechssler et al., 2009; Hoppe and Kusterer, 2011).[6] Between 17.2%

[4] Merit goods are commodities that are judged to be deserved by individuals irrespective of their ability or willingness to pay for them. In Musgrave (1959, p. 13), merit goods satisfy needs '*considered so meritorious that their satisfaction is provided for through the public budget, over and above what is provided for through the market and paid for by private buyers*'. For a more recent conceptualisation of the term see Ver Eecke (2003).

[5] In line with the literature, we consider circumstances as the factors that are beyond individual's responsibility, and effort as those for which individuals are deemed responsible. For a review on these ideas and their application to perceptions of fairness in distribution, see Pignataro (2012); Roemer and Trannoy (2015); Ferreira and Peragine (2016); Ramos and Van de Gaer (2016), and the references therein.

[6] Measuring cognitive ability is not straightforward (Carroll, 1993; Jensen, 1998; Colom et al., 2002). There are a number of distinct traits to be measured, which are evaluated by different tests (e.g., Need For Cognition, Wonderlic Personnel Test, Raven Advanced Progressive Matrices). A common feature of these is their aim to capture a generalization of the skills needed to succeed in tasks that require information processing. These tests are usually long and time consuming, restricting their widespread use. One test that overcomes this drawback is the Cognitive Reflection Test, based on the dual-system theory of Kahneman and Frederick (2002). The CRT questions have an intuitive incorrect response that results from a rapidly-executed cognitive process. However, the correct response requires the individual to apply deliberative and conscious thought.

and 32.3% of the sample in each country answered at least 2 of the 3 cognitive questions correctly: we call these high-cognition individuals. We will also see whether our results are robust to considering as high-cognition only those individuals who answered all three questions correctly (between 6.6% and 13.2% in each country).

We find that high-cognition individuals favor vaccine distribution schemes within their country of residence that prioritize vulnerable populations over other schemes emphasissing individual preventive behavior to avoid infection. These priorities are in line with their preferred distribution within the EU and across the World. Controlling for basic socio-demographic characteristics, the individual's COVID-19 history, reported concerns about COVID-19 infection, and confidence in the national health system to handle the pandemic, high-cognition individuals are 11.2 p.p. more likely to support schemes that favor circumstances in all scenarios, which figure is 35% above the mean.

These preferences are not driven by individual benefit (high-cognition individuals do not favor schemes that would grant them earlier vaccination) or vaccine-hesitancy. We instead suggest that they reflect pro-social preferences and behavior of high-cognition individuals, as well as their perceptions of lower equal opportunities in their country of residence.

The remainder of the paper is structured as follows. Section 2 describes the data and provides basic descriptive statistics. Section 3 presents the empirical strategy, and the results appear in Section 4. Last, Section 5 concludes.

2 — Data and Descriptive Statistics

2.1. Data

We use data from the COME-HERE (COVID-19, MEntal HEalth, REsilience and Self-regulation) panel survey collected by the University of Luxembourg starting in April 2020. The survey is representative of adults in France, Germany, Italy, Spain, and Sweden.[7] Respondents completed on-line questionnaires lasting around 20 minutes each. The survey collects information at both the individual and household levels, and is longitudinal. Ten survey waves have been carried out at the time of writing. The first wave was conducted in April 2020, and the most-recent in December 2022. Under 15% of participants of our sample in the first wave failed to complete an additional wave, and over half have been surveyed at least five times (see Annex A for more details on respondents' participation rates). Ethics approval for the study was granted by the Ethics Review Panel of the University of Luxembourg.

The primary objective of the survey is to collect individual information on living and mental-health conditions during the COVID-19 pandemic. Besides information on standard socio-demographic characteristics (e.g., age, gender, educational attainment, employment status, and household income), the survey

[7] The data is collected by Qualtrics and fulfill many high standard criteria. The respondent's IP addresses and electronic fingerprints are checked to discard duplicated observations. Also, information from surveys that are completed abnormally quickly is dropped. The samples are nationally representative, stratified by age, gender, and region of residence. Particular efforts are made to contact hard-to-reach groups (via specialised recruitment campaigns through local networks).

includes questions related to perceptions and well-being. In addition, specific modules were included in each wave to address a variety of topics. Notably, in March 2021 the questionnaire included questions on preferences for vaccine distribution, and in August 2020 questions to measure individual's cognitive ability. We describe the key variables for our study below.

Cognitive Ability. The third wave of COME-HERE, carried out in August 2020, includes the three standard questions of the Cognitive Reflection Test, as shown in Figure B.1 in the Annex. All of the questions have both a correct and an intuitive (but incorrect) answer. Following the usual procedure, we weight each question equally. We also account for possible errors-in-reporting driven by the units of measure used in question one, which have also been detected in previous studies (Sirota and Juanchich, 2018).[8]

Preferences for Vaccine Distribution. At the time of concern about limited vaccine availability in Europe, we introduced three questions about individual preferences for COVID-19 vaccine distribution (Wave 5, in the field in March 2021).[9] These referred to vaccine distribution within the respondent's own country, between EU member states, and across the World. The questions were designed to capture the two main factors behind equality of opportunity: circumstances, factors beyond the individual's control, and efforts, those that result from individual's choices. There is more equality of opportunity in a society the larger the part of effort relative to circumstances in determining individual outcomes such as education or income. The survey question asks respondents to choose among options that give vaccination priority to population groups that differ in the effort they exert (taking more or less care in avoiding infection) or their circumstances (being more or less vulnerable, or front-line workers). The effort variable in the question on vaccine distribution between EU countries is the stringency of the country's lockdown measures, and the circumstance variable is the percentage of the population who are vulnerable. Last, the question on how vaccines should be distributed across the World allows respondents to choose the criteria that should be used to decide how to pay for the vaccines (as a percentage of the country's GDP, or otherwise) and how to distribute them across the World (according to their needs, or to their financial contribution to the purchase of the vaccines).

The exact wording of the questions appears in Figures C.1, C.2, and C.3 in the Annex. The labels for each response, used throughout the rest of the document, are described in Table C.1 in the Annex.

Other individual variables. The empirical analysis includes a number of other variables. Basic socio-demographic variables (country of residence, sex, age, educational attainment) were collected in the first wave, while questions on employment, occupation, and household income appear in each wave (see tables in Annex A for descriptive statistics of these variables in our sample). We also use regularly-collected information on COVID-19 history, perceptions of its consequences, and related behavior (e.g., testing and compliance with preventive measures). Finally, we complement our analysis with information collected in

[8] A common ambivalence in CRT tests is the response 0.05 cents in question 1, as participants mistake the unit of answer (cents) for dollars (Sirota and Juanchich, 2018). In our data, a non-negligible share of the answers for question 1 reflect this unit-of-answer mistake. See notes in Figure B.1 and Table B.1 for further details

[9] In early February 2021, the EU proposed allowing governments to block vaccine exports due to limited production capacity, and one large European producer reported production shortfalls. See, for instance, https://www.ft.com/content/1b2afe60-b5e6-456d-98e0-313fe664d0b9 for a journalistic account of the situation.

a variety of special modules.[10] The topics include individual risk preferences, patience, pro-social behaviors (e.g., trust in others and hypothetical donations), inequalities (e.g, perceptions regarding the income-generation process and the government's efficiency in redistributing, and income comparisons), politics (e.g, perceived and desired public budget allocations), social identity, and fairness.

2.2. Descriptive Statistics

The descriptive statistics for the CRT test scores are presented in Table 1a. The percentage of correct answers ranged from 18.5% to 32.8% for each question. Over half of the respondents answered all questions incorrectly (56.0%), while 9.0% answered them all correctly. These values place our sample on the left tail of scores observed in this test.[11]

Table 1 — Descriptive statistics

(a) Cognitive Reflection Test

	Share (1)
Panel A. Individual questions	
Bat & Ball	17.3
Machines	31.2
Lily pads	27.5
Panel B. Aggregation	
Score = 0	56.0
Score = 1	21.0
Score = 2	13.9
Score = 3	9.0

Notes: This table describes the results from the Cognitive Reflection Test. Panel A shows share of correct responses for each individual question. Panel B shows the total number of correct answers. The sample size is 5,541 for all rows.

(b) Vaccine distributions prioritizing circumstances

	Share (1)
Panel A. Individual questions	
World	51.7
EU	67.6
Country	82.6
Panel B. Aggregation	
Sum = 0	5.3
Sum = 1	21.4
Sum = 2	39.3
Sum = 3	34.0

Notes: This table lists the population shares for preferring vaccine-distribution schemes that prioritize circumstances. Panel A shows the responses to each individual question. Panel B shows the total number of responses to all three questions. The labels used in the rest of the document are explained alongside the question descriptions in Table C.1. The sample size is 4,950 for all rows.

These test scores convey useful information. They are positively correlated with educational attainment (Figure B.2b) and income (Figure B.3), in line with previous work (Heckman et al., 2006). Respondents with postgraduate qualifications scored 0.31 points higher than the average, while those whose with Secondary-school qualifications at most scored 0.20 points below (both differences are significant at the 95% confidence level). The scores also differ along other socio-demographic dimensions: men score significantly higher (see Figure B.2d), as is common for this type of test (Frederick, 2005; Zhang et al., 2016; Brañas Garza et al., 2019); and the Northern countries (Germany and Sweden) outperformed the

[10] The timing of the data collection in each module is different: some variable were collected before the main outcomes in our analysis, and others afterwards. We discuss this in the results section.

[11] Frederick (2005) collects test scores in different locations in the US and in one University in Spain, finding a mean percentage of respondents with no correct answers of 33% (ranging from 7% to 64%). The analogous figure for all correct answers is 17% (from 5% to 48%). The scores for Spain are similar to those for Spain in our sample. In a recent meta-study (Brañas Garza et al., 2019) of 118 CRT results covering 45,000 participants, and find that, 38% of respondents answer all questions incorrectly, and 18% answer all of them correctly.

rest (see Figure B.2a).

Based on the CRT test results, we define individuals with scores of 2 and 3 (22.9% of respondents) as being high-cognition. Table B.4 in the Annex shows how basic socio-demographic characteristics and attitudes vary between individuals with low and high CRT scores. The cognitive-able are more risk-averse and more patient, but do not differ significantly in their trust towards others. This is consistent with earlier work showing that individuals with higher IQs are more patient and more risk-averse (Potrafke, 2019).[12] Table 2 shows that high-cognition individuals were equally likely to have had COVID-19 or to be close to someone who became ill or died during the pandemic. However, their perceptions about the pandemic and society differ. They are more prone to think inequality of opportunities restrict the possibility of economic success, and that luck matters for how well an individual does economically in life, despite having similar ideals on how much it should matter.

Table 2 — Group comparison. COVID-19 variables

	Total sample (1)	High CRT score (2)	High vs. Low (3)
Panel A. COVID-related history			
Tested for COVID-19	.336	.290	-.036
			(.023)
Had COVID-19	.090	.089	.008
			(.015)
Close to someone ill	.068	.079	.011
			(.012)
Close to someone who died	.101	.099	.004
			(.016)
Panel B. COVID perception			
Worried about getting COVID-19	.435	.363	-.072***
			(.016)
Worried about severe COVID-19	.390	.306	-.085***
			(.016)
Health system coping capacity	.638	.664	.041**
			(.014)
Panel C. COVID-related behaviors			
Follows measures	.842	.842	.028**
			(0.012)

Notes: This table describes the characteristics of the sample used in the analysis. All responses are contemporary to those of vaccine distribution. Columns (1) and (2) show the means, and column (3) the differences between individuals with CRT scores of 2 and 3 (high score) and individuals who scored 0 and 1 (low score) controlling for socio-demographic characteristics (see the details in Table B.4). Robust standard errors appear in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.2 in the Annex lists population shares for each response in each of the three questions related to the COVID-19 vaccine distribution. The responses to these three questions can be categorized according

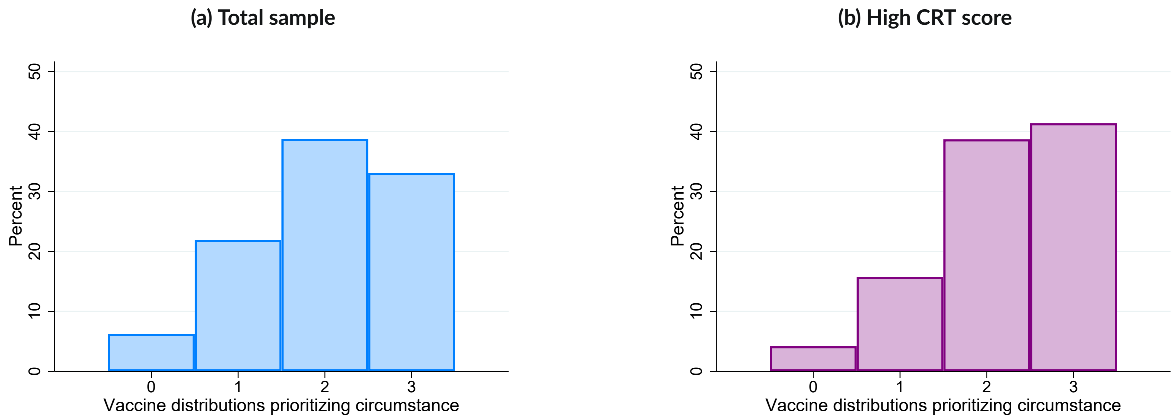
[12] Other work, however, has found that cognitive ability is positively related to willingness to take risks and patience (e.g., see Frederick, 2005; Burks et al., 2009; Dohmen et al., 2010; Benjamin et al., 2013). However, more recently Andersson et al. (2016) shows that the relationship between cognitive ability and risk preferences may be spurious, due to bias from noisy decision making.

to how individuals prioritize between circumstances and efforts. Individuals are classified as giving priority to circumstances (falling outside individuals or countries responsibility) if they answer: distribute vaccines according to 'Needs' in the case of distribution across the World, to 'Population' and 'Vulnerability' across the EU, and to 'Vulnerability' and 'Vulnerability and Carefulness' in the case of vaccine distribution within the country. Table 1b displays the population shares for these responses to each question, and the aggregate measure. Around 34% of the population preferred distribution schemes based on circumstances in all questions, while 5.3% always prioritized vaccine distribution based on country or individual effort.

These answers provide relevant information, not only for the particular case of vaccine distribution during the COVID-19 pandemic, but also in other situations. In our data, those who always put circumstances first for vaccine distribution tend to be more-active in non-governmental organizations that promote the common good, and are more supportive for income redistribution (see Figure C.5 in the Annex).

High-cognition individuals are more likely to favor these replies in all of the three questions. Figure 2 shows the distribution of the number of preferred vaccine-distribution schemes prioritizing circumstances in the total sample and for high-cognition individuals. The distribution for high-cognition individuals is slightly skewed to the right. The results for each individual question are shown in Figure C.4 in the Annex.

Figure 2 — Vaccine distributions prioritizing circumstances



Notes: These figures plot the shares of the population preferring vaccine-distribution schemes that prioritize circumstances in the total sample and fo those individuals with CRT scores of 2 and 3 (high score). The CRT scores were measured in August 2020, and preferences for vaccine distribution in March 2021. The sample size is 4,317 for the total population and 989 for population with High CRT score.

3 — Empirical Strategy

We estimate a linear-probability model for support for prioritizing circumstances in all vaccine-distribution schemes in the following model for $(i = 1, \ldots, N, j = 1, \ldots, M)$,:

$$y_{ij} = High\_CA_i\beta + X_i\gamma + \lambda_j + \epsilon_{ij} \tag{1}$$

Here y_{ij} is a dummy for the total support by individual i from country j for vaccine-distribution schemes prioritizing circumstances, $High\_CA_i$ a dummy variable for individual i scoring 2 or 3 in the CRT, X_i a vector of individual characteristics with one as the first element, λ_j the country of residence fixed-effects; and ϵ_{ij} the error term.

Preferences for vaccine distribution were assessed in March 2021, while cognition test scores were measured seven months earlier in August 2020. We control for time-invariant socio-demographic characteristics measured in April 2020 (sex, age group, and educational attainment) and time-variant characteristics collected at the same wave as vaccine-distribution preferences (employment status, occupation, and household income). We also include pandemic-related variables, such as the history of COVID-19 infection, concerns about getting it, and confidence in the national health system to cope with the pandemic. We will present robustness checks including fewer or no controls.

The main parameter in Equation (1), β, captures the correlation between being a high-cognition individual and vaccine-distribution preferences. This reflects both the causal effects of cognition and that of other variables correlated with cognition. As is usual in the literature, we cannot control for all of the potential confounders as some are unobserved in our data.[13] We do however check that the correlation is robust to a number of observable variables. Given the large number of observables available, we have some confidence that we have identified a real effect.

To check robustness to the functional form, we estimate a probit model of the probability of supporting all schemes prioritizing circumstances and an ordered probit model for the number of distribution schemes where circumstances are prioritized. We last estimate the support for each specific vaccine-distribution scheme K in $(k = 1, \ldots, K)$ referring to the World/EU/country $(q = 1, \ldots, Q)$ via separate multinomial logit models, which allow us to account for correlation between the answers to each question without imposing an order on the dependent variables. These are based on the following:

$$P(y_{ijq} = k \,|\, High\_CA_i, X_i, c_j) = G(\cdot) \tag{2}$$

with k discrete responses for question q; and c_j being the country of residence. We derive the index models $G(\cdot)$ from the following underlying latent model:

$$y^*_{ij} = High\_CA_i\beta + X_i\gamma + \lambda_j + \epsilon_{ij}. \tag{3}$$

We define $G(\cdot)$ to reflect the three types of outcomes above. We present MLE coefficients of $High\_CA$ in each model and the marginal effect for the probability of each answer.

[13] Despite the measurement of cognition preceding that of our outcome variables, it may well be determined by unobservable variables. Cognition measured during adulthood reflects early-life conditions and long socialization and learning processes. We cannot account for all of these.

4 — Results

4.1. Aggregate results

We first discuss the estimates for the total support for vaccine distribution that prioritizes circumstances, where the latter reflects answering that (i) countries should contribute to vaccine purchase according to their wealth, (ii) EU countries should receive vaccines in proportion to their clinically-vulnerable population, and (iii) clinically-vulnerable individuals in a country should be vaccinated first. High-cognition individuals are 10.3 p.p. more likely to support these types of schemes (see Table 3). The coefficient is precisely estimated (s.e.0.026). Controlling for basic socio-demographic characteristics and the COVID-19 related variables (the history of COVID-19 infection, concern about getting COVID-19, and confidence in the national health system), slightly increases the estimate to 11.7 p.p. (s.e. 0.025). This estimated gap is sizable, being 35% above mean support.

Table 3 — Total support for distributional schemes prioritizing circumstances

	LPM			Probit	Margins
	(1)	(2)	(3)	(4)	(5)
$High\_CA$	.103***	.128***	.117***	.336***	.112***
	(.026)	(.025)	(.025)	(.071)	(.023)
Socio-demographic			X	X	X
COVID-19 related		X	X	X	X
N	2,511	2,511	2,511	2,511	2,511
R^2/pseudo-R^2	.009	.068	.077	.064	-

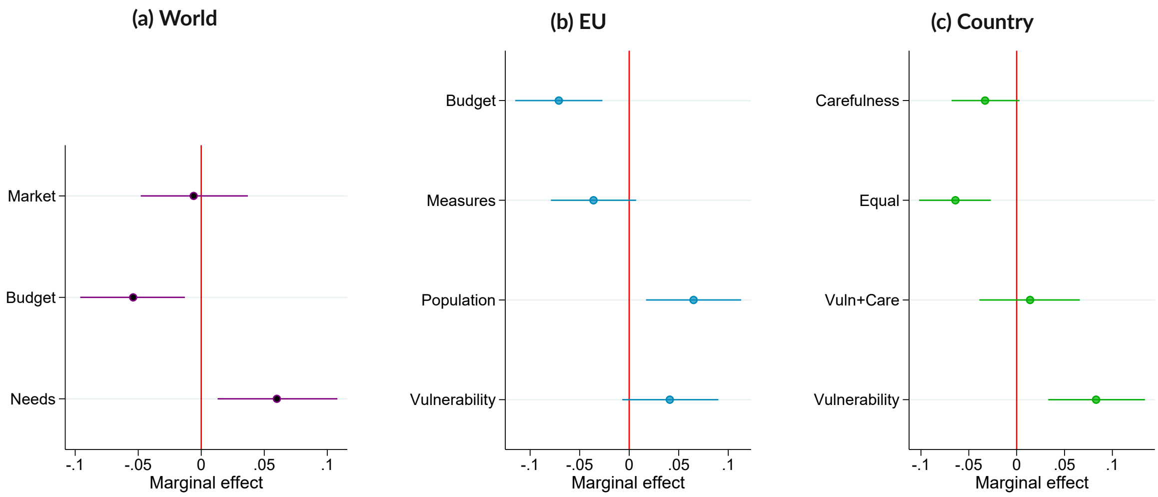
Notes: This table reports the coefficients for total support for vaccine-distribution schemes that focus on circumstances on a dummy for CRT scores of 2 or 3. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317 in the estimation sample. Columns 1 to 3 report estimates from a linear-probability model. Column 4 reports estimates from a probit model. Column 5 reports the marginal effect at the mean. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence; the COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Our initial results continue to hold in ordered probit regressions of the intensity of preferences (see Table D.1). High-cognition individuals are less likely to prefer 0 or 1 distributional schemes based on circumstances, with the former figure being 75% lower than the mean figure. As above, they are also more likely to prefer that all three schemes be focused on circumstances.

We obtain similar results considering each individual response. Figure 3 plots the marginal effects from the high-cognition dummy for each type of vaccine distribution, controlling for socio-demographic and COVID-19 variables. The tables underlying these figures appear in the Annex (Tables D.2, D.3, and D.4).

The figure shows, for example, that high-cognition individuals are 8.4 p.p. more likely to give priority to vulnerable populations in the vaccine distribution in their own country (see Table D.4). These preferences are consistent across vaccine-distribution questions (see Tables D.2, D.3, and D.4). Similarly, high-cognition individuals are less likely to prefer vaccine-distribution schemes based on effort. For example, they are

Figure 3 — High cognitive ability marginal effect



Notes: These figures plot the marginal effects for the $High\_CA$ dummy for each vaccine-distribution question. All regressions control for 'Socio-demographic' and 'COVID-19 related' variables, as defined in Table 3. The 95% confidence intervals are constructed with standard errors calculated via the Delta method.

3.3 p.p. less likely to prefer a vaccine distribution scheme in which those who were more careful during the pandemic receive vaccines first (Table D.4). They are between 5.4 p.p. and 7.4 p.p. less likely to favor the budget as a factor for vaccine distribution between countries in the World or the EU, as shown in Tables D.2 and Tables D.3).

Alternative high-cognition group. We check that these results are robust to the definition of high cognition. Annex E includes estimates (i) defining as high cognition individuals those who answer all three questions correctly (9% of the population) and (ii) using CRT scores as a categorical independent variable. For (i), the coefficients remain fairly similar and precisely estimated: ranging from 0.098 (s.e. 0.035) to 0.118 (s.e. 0.038), depending on the controls included (see Tables E.1, and E.2). For (ii), with a categorical CRT variable from 0 to 3, the stylized facts above mostly continue to hold (see Tables E.3), with the estimated coefficients for CRT scores of 2 and 3 being very similar.

Alternative classification of vaccine-distribution preferences. We also consider a tighter criterion for classifying a response as 'prioritizing circumstances over effort'. We limit these to: 'vaccines should be distributed according to each country's needs' (Needs in Table C.1) and 'proportional to the member state's clinically vulnerable population' (Vulnerability in Table C.1). With this definition, the mean share of population always prioritizing circumstances drops from 34 to 8.4%. The high-cognition coefficient is now significantly smaller, but remains positive and significant. The coefficient on a high CRT score ranges from 0.032 to 0.39, depending on the controls. With all of the controls, this is 3.4 p.p. (see Table E.4), corresponding to support around 40% above the mean.

Additional controls and specifications. We check that our results are robust to adding additional controls related to individual: (i) COVID-19 related risk factors (see Table E.5) and (ii) perceptions about COVID-19 (see Table E.6). The first set covers whether the individual has pre-existing medical conditions (cancer, lung diseases, heart diseases, and diabetes), is a front-line worker, and follows recommendations to prevent the diffusion of the virus. The second set captures individuals' reported concerns about catching COVID-19 and their perceived probabilities of different outcomes if they do catch it. Our results are robust to including all, none or some of these two set of controls, as well as controlling for age as a continuous variable, and including additional controls for those aged 60 and over.

Heterogeneity. We explore heterogeneity by socio-demographic characteristics (see Table D.5) by introducing interaction terms between high cognition and sex, age, employment status, household income, educational attainment, and country of residence. While the main coefficient remains positive, precisely estimated, and similar to that in the baseline specification, the interaction terms are very imprecisely estimated and relatively small for all variables except employed and income. We conclude that there is no significant heterogeneity in the high cognition coefficient for the support of distributional schemes prioritizing circumstances.

4.2. Mechanisms exploration

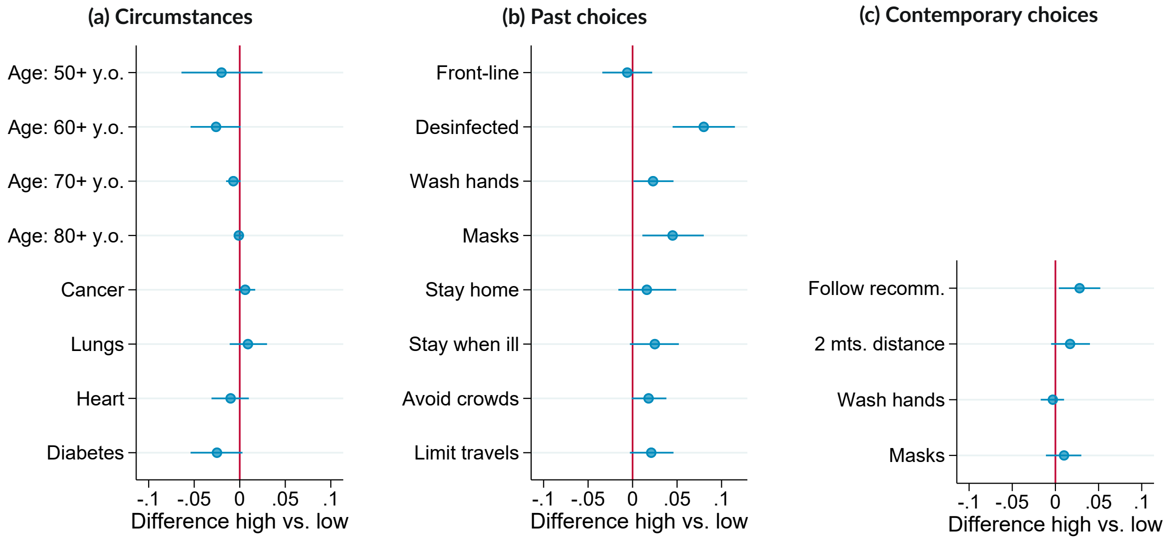
Preferences for vaccine distribution emphasizing circumstances over outcomes or effort can stem from a number of sources. In this section we provide evidence that high-cognition individuals' preferences over vaccine distribution are driven by their concerns about those who are more vulnerable, as opposed to self-interest. We lend weight to this reading by ruling out alternative causes related to self interest and that may yield similar responses: scheme convenience, differential eligibility status, early-adoption aversion, and differential cost perceptions. We also show that individuals favoring vaccine distribution according to circumstances report other-regarding preferences in other survey questions: the perception of equality of opportunities, social participation, and support for redistribution.

Table 6 lists the baseline results (column 1) and those including controls to test for each of the four mechanisms noted above (columns 2 to 5). Column 6 includes controls for all four mechanisms at the same time.

Scheme convenience. The proposed vaccination schemes favor groups with particular characteristics, for example front-line workers or those who took more care during the pandemic. Individual preferences may therefore take into account their own benefit. If these characteristics are positively correlated with cognition, our findings could be driven by self-interest. Our baseline regression includes a number of controls to address this concern. We further check for differences between high- and low-cognition individuals that could lie behind the responses with respect to the characteristics specifically mentioned in the vaccine questions: clinical vulnerability, front-line workers and care taken during the pandemic to avoid infection.

The high-cognition individuals in our sample are not much different in terms of medical vulnerability to COVID-19. Graph 4a plots the differences in age-groups and prevalence of medical conditions. The percentage aged over 60 is slightly lower in the high-cognition group, but the percentage over 80 is the same. There are no significant differences in the prevalence of cancer, lung, and heart diseases between the two groups, or in the share of front-line workers. COVID-19 avoidance behaviors do however differ slightly between groups (see Graph 4b). High-cognition individuals were slightly more careful at the beginning of the pandemic, with significant differences for disinfecting surfaces, washing hands, and acquiring masks. By the time the distribution preferences were elicited, these differences were smaller, although the cognitive-able remained slightly more likely to follow recommendations (see Graph 4c).

Figure 4 — Differences in circumstances and choices



Notes: These figures plot the estimated differences between individuals with CRT scores of 2 and 3 (high score) and individuals who score 0 and 1 (low score) controlling for socio-demographic characteristics (see details in Table B.4). Circumstances refer to age and declared medical conditions in April 2020 (no age controls are added). Past choices refer to front-line occupation (health services) and COVID-19 related behaviors in April 2020. Contemporary choices refer to COVID-19 behaviors in March 2021. The bars refer to 95% confidence intervals with robust standard errors.

In short, high-cognition individuals are mostly not affected differently when vaccine distribution prioritizes the medically vulnerable and front-line workers, although they might have been somewhat favored if those who took less care were punished.[14] Table E.5 shows that our baseline results are unchanged when including these variables. The difference in the estimated coefficient is small and only statistically significant, at the 10% level, when controlling for adherence to recommendations to prevent COVID-19 spread. When including all three controls, the coefficient falls very slightly to 0.110 but remains very precisely estimated (s.e. 0.022).

Actual eligibility. We further check if responses are self-interested by exploring differences by vaccine accessibility. At the time the preferences were elicited, some people were already eligible for vaccination while others were not. These eligibility differences, which might be correlated with cognition, could affect responses. Those who were not eligible may have been in favor of schemes that accelerated their vaccination elegiblity.

We use information on pandemic policy responses from the Oxford COVID-19 Government Response Tracker (OxCGRT).

[14] The same holds for vaccination orders across countries. Our sample subjects live in countries that are richer, have larger populations, and contribute more to the EU budget (see Table A.6). In 2019, Germany, France, Italy, and Spain were the top four countries in the EU in terms of GDP, population, and total population above 65, and budget contribution to the EU in the 2014-2020 period (excluding Great Britain). Sweden ranked 12th in total and old population, and 8th in EU-budget contribution. The five countries are in the top 25 wealthiest countries in the World in 2019, measured by total GDP in current U$S.

We exploit cross-country, -time, and -individual variations in vaccine eligibility, based on age group, medical condition, and front-line occupations. Merging individual information to government policies allows us to derive eligibility status at the time of the survey.[15]

Table 4 — Vaccination eligibility

	Total sample	High CRT score	High vs. Low
	(1)	(2)	(3)
Contemporary: March 2021	.085	.077	-.009
			(.014)
3 months after: June 2021	.786	.835	.029
			(.021)
7 months after: October 2021	1.000	1.000	.

Notes: This table describes the declared COVID-19 vaccine eligibility of the analysis sample. Columns (1) and (2) show the means, and column (3) the differences between individuals with CRT scores of 2 and 3 (high score) and those who score 0 and 1 (low score) controlling for socio-demographic characteristics (see the details in Table B.4). Vaccine eligibility in March 2022 is excluded, as it is the same as that in October 2021: universal access. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

There was little eligibility at the time the vaccine-distribution questions were asked, and distributed similarly by cognition (see Table 4): 7.7% of high-cognition individuals were eligible, as compared to 8.5% of the others. These figures were respectively 83.5 and 78.6% three months after the survey took place (June 2021). We see in Table 6 that controlling for vaccines access (eligibility) does not affect the differential response of high-cognition individuals.

Early adoption aversion. If responses were not driven by the desire to get vaccinated first, they may have been driven by the desire to delay it. Vaccine hesitancy has been observed for different subpopulations throughout the pandemic (Troiano and Nardi, 2021), fueled by uncertainty (short and long-term effects, efficiency, and immunization status). Some people could have been more averse to being among the first to receive the COVID-19 vaccine. For each specific individual, however, delaying vaccination means prioritising circumstances or effort differently. Although there is no difference in circumstances across the two groups, high-cognition individuals took slightly more care during the pandemic. Therefore, if anything, high-cognition individuals would be in favor of prioritizing circumstances (and not effort) if they wished to delay their own vaccination. In order to rule out vaccination hesitancy as an explanation, we use information on concerns regarding vaccines and declared vaccination status 3, 7, and 12 months after vaccine-distribution responses.

We first analyze self-reported concerns for not taking the COVID-19 vaccine one year after the vaccine-distribution questions were asked. These include side effects from the vaccines, inefficiency, safety, needle phobia, and conspiracy theories, among others. The share of people expressing any of these concerns is small (under 5% for any motive). We find no statistical difference for high-cognition individuals (see Figure B.6 in the Annex). In addition, although the gap is not statistically significant, high-cognition indi-

[15] We consider people diagnosed with cancer as those medically at risk. Oncology patients were prioritized in all countries in our sample due to greater mortality risk if catching COVID-19. We consider workers in the health sector as front-line workers.

viduals systematically express fewer concerns about COVID-19 vaccines.

We also explore vaccination rates 3, 7, and 12 months after the responses: these are higher for high-cognition individuals, especially in the first months (see Table 5). The cognitively-able are more vaccinated 3 months and 7 months later (3.6 and 2.8 p.p. above the mean, respectively). This gap reduces to 1.8 p.p. one year after and becomes insignificant. Thus, if anything, high-cognition individuals are more likely to be early adopters of the COVID-19 vaccine, so that vaccine reluctance is not a plausible explanation of our main findings. This difference is also not explained by differential access to vaccines, as there is no significant difference in this between groups (see Table 4).

Table 5 — Vaccination status

	Total sample	High CRT score	High vs. Low
	(1)	(2)	(3)
3 months after: June 2021	.859	.895	.036*
			(.019)
7 months after: October 2021	.927	.945	.028*
			(.015)
12 months after: March 2022	.922	.933	.018
			(.017)

Notes: This table describes the declared COVID-19 vaccination status in the analysis sample. Columns (1) and (2) show means, and column (3) the differences between individuals with CRT scores of 2 and 3 (high score) and those who score 0 and 1 (low score) controlling for socio-demographic characteristics (see the details in Table B.4). Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The costs of infection. As shown above, the objective COVID-19 risk factors (measured by age, pre-existing medical conditions, and being a front-line worker) do not seem to explain the differences we find. However, individuals may differ in their beliefs about their health prospects in the pandemic. The most cognitive-able individuals perceived risks differently (see Table 2). They were less worried about catching COVID-19 and getting seriously ill from it, trusted more the health system's capacity to cope with demands from the pandemic more, and believed that other's probabilities of suffering severe COVID-19 were lower. In short, the cognitive-able were more confident about what could happen throughout the pandemic (see Figure B.4a, Figure B.5a, and Figure B.4b in the Annex). These perceptions do not seem to reflect over-confidence, as they match the official statistics on the consequences of COVID-19.[16]

Including concerns and perceptions about COVID-19 slightly reduces our baseline coefficient at a 10% level: the high cognition coefficient with these controls ranges from 0.122 to 0.112 (see Table E.6).

Prosociality. Having ruled out other alternative explanations, we suggest that our findings show that high-cognition individuals have greater other-regarding preferences (concerns towards others). We appeal to different variables capturing social perceptions and behaviors: perceptions about the role of luck (as opposed to effort) in outcomes and equality of opportunities, hypothetical donations to a 'good cause',

[16] Estimates for the infection-hospitalization ratio (IHR) range between 2% and 3% (Salje et al., 2020; Lapidus et al., 2021; Le Vu et al., 2021; Menachemi et al., 2021). These results are based on registered hospitalizations and COVID-19 positive cases derived from antibodies prevalence in representative samples. The latter takes into account the underreporting of COVID-19 cases (mainly due to little testing of people with mild or no symptoms). The mean believed IHR for total population in our estimation sample is 11.6%; for high-cognition individualsthis drops to 7.3%.

and trust in people, in other's fairness and in other's helpfulness. We find that the joint inclusion of these variables reduces the $High\_CA$ coefficient by 36% (from 0.117 to 0.075), a difference that is statistically significant at a 1% level (see Table 6).

In column 6 of Table 6 we include all of the individual controls that appeared singly in columns 2 to 5. The high-cognition coefficient in column 6 is statistically identical to that in column 5, which only controls for prosociality: 0.080 (s.e. 0.023) versus 0.075 (s.e. 0.022). These findings suggest that greater social concerns are a significant part of the explanation of why the most cognitively-able individuals prefer COVID-19 vaccine distribution schemes prioritizing circumstances.

We further explore which social attitudes are the main drivers. We find that perceptions of equal opportunities drive these findings (see Table E.7). In particular, perceptions of equality of opportunity capture 27% of the overall effect, and reduce the coefficient from 0.117 to 0.085. The other variables related to social perceptions and behaviors (importance of luck, hypothetical donations, and trust) only slightly alter the main coefficient. As such, the relationship between cognition and preferences for vaccine distribution favoring circumstances partly reflects perceptions about the equality of opportunities in society.

We use additional information from more recent COME-HERE waves, and find that the desired level of equality of opportunities does not differ by cognition (see Table B.4). In that sense, the vaccine-distribution preferences of the cognitively-able do not reflect preferences over equality, but rather that they are more negative about the prevalence of equal opportunities.

Table 6 — Total support for distributional schemes prioritizing circumstances with additional controls

	(1)	(2)	(3)	(4)	(5)	(6)
$High\_CA$	.117***	.110***	.117***	.112***	.080***	.075***
	(.023)	(.022)	(.023)	(.023)	(.022)	(.022)
(+) Scheme convenience		X				X
(+) Actual eligibility			X			X
(+) Cost perception				X		X
(+) Prosociality					X	X
Wald test	-	3.046	.260	2.987	25.622	18.873
p-value	-	.081	.610	.084	.000	.000
N	2,511	2,511	2,511	2,511	2,511	2,511
R^2	.077	.091	.077	.081	.115	.127

Notes: This table reports the coefficients for total support for vaccine distribution schemes that focus on circumstances on a dummy for CRT scores of 2 and 3. The dependent variable is valued 1 when all three vaccine distribution schemes favor circumstances, and 0 otherwise. Mean dependent variable is 0.317 in the estimation sample. All columns report estimates from a linear probability model. Column 1 reports estimates from our main specification. Columns 2 to 6 report estimates adding controls to the main specification. Main specification controls include sex, age group, educational attainment, occupational status, household income, country of residence, history of contracting COVID-19, concern about getting it, and confidence in the national health system to cope with the pandemic. Scheme convenience controls include concern about catching COVID-19 (measured in March 2021) and assigned probabilities for COVID-19 outcomes (measured in August 2020). Actual eligibility is derived for March 2021 based on information on policy responses from OxCGRT and individual's age group, medical risk condition and front-line occupation (all of which were measured in April 2020). Cost perception controls include concern about catching COVID-19 (measured in March 2021) and assigned probabilities for COVID-19 outcomes (measured in August 2020). Prosociality controls include perceptions about role of luck (as opposed to effort), perceptions about equality of opportunity, hypothetical donation to 'a good cause', and trust in people, other's fairness and other's helpfulness, all of which were measured in March 2021. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Wald test for equality of $High\_CA$ coefficient with main specification are reported, with its associated p-value.

5 — Conclusions

Priorities in the order of vaccination are a clear example of distributional preferences. The COVID-19 pandemic context made the exogeneity of circumstances and the relevance of distribution even more salient, providing an upper-bound benchmark of the importance of the factors lying behind these preferences. This paper therefore provides a reference point for more-standard situations, as well as an approximation to the distributive preferences to be expected in future critical periods (e.g., economic crises or environmental disasters).

We focused on high-cognition subjects, who tend to have a larger say in distributional policies. We find that they support vaccine schemes that value circumstances over effort in determining who should receive vaccines first and who should pay for them. We show that our findings are largely driven by high-cognition individuals showing more concerns towards others, and provide a likely underpinning for this concern in terms of the perception of less equality of opportunity. The reasons why these individuals perceive fairness in society differently is a topic that deserves further exploration.

Our findings provide an explanation of distributional policies across societies. We show that a highly-influential group in collective decisions prioritizes those who are more vulnerable in critical moments. This could explain the ubiquitous success of policies such as safety net, food stamps, and housing assistance. While many central topics have been analyzed, others have remained largely unaddressed (e.g., environment). There are thus many open questions. Future research should explore how preferences change alongside the assessment of how critical the situation is, and what determines which situations are considered to be critical.

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A — Data characteristics

Table A.1 — Observations per wave

Wave	Period	Response share	#
Wave 1	Apr-May 2020	100.0	8,063
Wave 2	Jun 2020	59.4	4,788
Wave 3	Aug 2020	69.0	5,565
Wave 4	Nov-Dec 2020	69.4	5,594
Wave 5	Mar 2021	61.4	4,950
Wave 6	Jun 2021	53.0	4,271
Wave 7	Oct-Nov 2021	50.6	4,082
Wave 8	Feb-Mar 2022	45.2	3,644

Notes: This table reports responses statistics by survey wave. Column (1) shows responses as a percentage of the first-wave response figure. Column (2) shows the total number of responses in each wave.

Table A.2 — Response share per waves by country

Wave	Period	Total	FR	DE	IT	ES	SE
Wave 1	Apr-May 2020	100.0	100.0	100.0	100.0	100.0	100.0
Wave 2	Jun 2020	59.4	60.3	59.1	59.1	59.8	58.1
Wave 3	Aug 2020	69.0	69.6	70.6	72.3	71.4	58.0
Wave 4	Nov-Dec 2020	69.4	71.6	66.5	73.3	71.7	61.7
Wave 5	Mar 2021	61.4	64.9	55.2	65.3	65.3	54.1
Wave 6	Jun 2021	53.0	56.3	41.0	56.8	60.9	48.5
Wave 7	Oct-Nov 2021	50.6	54.3	40.2	54.6	57.8	44.5
Wave 8	Feb-Mar 2022	45.2	50.1	34.9	47.7	52.5	39.1

*Notes:*This table lists responses as a percentage of the first-wave response figure by country. Column (1) shows the total number of responses. Columns (2), (3), (4), (5), and (6) show the response shares for France, Germany, Italy, Spain, and Sweden respectively.

Table A.3 — Number of waves responded per person, share by country

Waves responded	#	Total	FR	DE	IT	ES	SE
1 response	1,159	14.4	14.2	16.0	12.6	12.9	16.9
2 responses	748	9.3	8.1	9.4	9.3	8.5	11.8
3 responses	665	8.2	7.1	10.3	7.2	7.2	9.9
4 responses	717	8.9	7.7	13.2	7.5	7.2	8.6
5 responses	686	8.5	7.9	11.3	7.7	6.9	8.9
6 responses	705	8.7	9.1	6.3	10.5	8.1	10.1
7 responses	1,285	15.9	16.4	13.3	16.8	17.2	16.1
8 responses	2,098	26.0	29.5	20.2	28.4	32.0	17.7

Notes: This table shows the number of response waves per individual by country. Column (1) shows the number of indivduals by number of responses. Column (2) shows the shares per number of responses in the total sample, and columns (3), (4), (5), (6) and (7) those for France, Germany, Italy, Spain and Sweden respectively.

Table A.4 — Sample characteristics in Wave 1.

(a) Age

	Share (1)
18-24	11.5
25-29	7.3
30-39	17.4
40-49	17.9
50-59	16.0
60-69	19.3
70-79	9.7
80+	0.8

(b) Educational attainment

	Share (1)
Primary	7.8
Secondary	37.5
Vocational	13.7
University	20.4
Postgraduate	19.8
Other	0.8

(c) Sex

	Share (1)
Male	48.3
Female	51.7
Other/NA	0.1

Notes: These figures refer to the estimation sample. The sample size is 8,063 in all tables.

Table A.5 — Sample characteristics. Time-varying characteristics.

(a) Employment status

	Share (1)
Employed full-time	45.9
Employed part-time	10.7
Marginal/Irregular	1.7
Non-employed	12.6
Retired	23.5
Student	5.6

(b) Country of residence

	Share (1)
France	21.2
Germany	20.5
Italy	21.3
Spain	21.7
Sweden	15.4

(c) Household's income

	Share (1)
Less than 1250 Euros	13.4
1250-2000 Euros	23.1
2000-4000 Euros	37.9
More than 4000 Euros	17.8
Non-declared	7.8

Notes: These tables refer to the estimation sample. The sample size is 24,089 for employment status, and 33,231 for country of residence and household income.

Table A.6 — Country rankings

	World GDP	EU Budget contribution	Population	Vulnerable population	Lockdown stringency
	(1)	(2)	(3)	(4)	(5)
Germany	4	1	1	1	8
France	7	2	2	3	7
Italy	8	3	3	2	1
Spain	13	4	4	4	3
Sweden	24	12	12	8	13

Notes: This table reports country rankings in the World (column 1) and the European Union (columns 2 to 5). Column 1 refers to total Gross Domestic Product in current U$S in 2019. Column 2 refers to total national contribution in the 2014-2020 EU Multiannual Financial Framework. Column 3 refers to estimates of total population in 2019, and column 4 to the population over 65 years old in the same year. Column 5 displays the average 'stringency' index from February 1st 2020 to January 31st 2021. The index is a simple average of all closure and containment indicators (schools, workplaces, public events, gatherings, public transport, 'stay at home' mandates, internal and external movement, and public health campaigns). The sample size for the rankings is 217 for the World, and 27 for the EU. *Sources:* The data for GDP and population is from the World Bank, that for the EU budget contribution from the European Commission, and that for lockdown stringency from OxCGRT.

B — Cognitive Reflection Test

Figure B.1 — Cognitive Reflection Test questions

1. **Bat & Ball:** A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost? ______ cents.
2. **Machines:** If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? ______ minutes.
3. **Lily pads:** In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? ______ days.

Notes: The correct (intuitive) answers are 5 (10) cents, 5 (100) minutes, and 47 (24) days, respectively. The questionnaire required the submission of an open-ended response in order to continue. This may have produced nonsense responses instead of missing values for some individuals. We deal with this by considering as valid responses (non-missing observations) those in the top 10 for each question. Additionally, the open-ended format can generate coding ambivalence. We account for this by collapsing the intended responses into the proper unit of measure considering that they overcome the intuitive response. We thus consider all three responses around 5 cents as correct (i.e. 5, 0.5 and 0.05).

Table B.1 — CRT responses

(a) Bat & Ball

Response	Share
10.00	46.8
0.10	20.0
5.00	9.5
0.50	5.7
1.00	5.2
0.05	2.0
2.10	1.2
50.00	1.0
0.00	0.9
100.00	0.6

(b) Machines

Response	Share
100	44.1
5	31.1
500	5.6
20	4.8
1	4.5
50	1.5
10	1.4
0	0.8
10 024	0.5
1000	0.5

(c) Lily pads

Response	Share
24	51.8
47	27.4
12	2.3
48	1.8
96	1.7
1	1.5
2	1.0
10	1.0
0	1.0
5	0.9

Notes: The above three tables report response shares for 10 responses with the highest frequency for each CRT question. In each table, column (1) shows the numeric response and column (2) shows the share of individuals who chose the corresponding numeric response. Among the ∼5,500 responses for the test, there where 101, 109 and 112 unique responses for questions 1, 2, and 3 respectively. The responses were very concentrated. The Top 10 responses for each question attracted 93%, 94.6%, and 90.5% of the total, respectively. A common ambivalence in CRT tests is the response 0.05 cents in question 1, as participants mistake the unit of answer (Cents) for Dollars (Sirota and Juanchich, 2018). In our data, a non-negligible share of answers for question 1 make this unit-of-answer mistake. Note that the top 6 responses are variations of 10 and 5 cents, using different decimal position.

Table B.2 — CRT results. Comparison with other studies

	Share				
	COME-HERE	Brañas Garza et al. (2019)	Brañas Garza et al. (2012)	Frederick (2005)	
				Total	ES
	(1)	(2)	(3)	(4)	(5)
Panel A. Individual questions					
Bat & Ball	18.5	31.8			
Machines	32.8	40.2			
Lily pads	30.3	47.8			
Panel B. Total scores					
Score = 0	56.0	37.5	67.0	33	64
Score = 1	21.0	23.2	23.0	28	21
Score = 2	13.9	21.1	8.9	23	10
Score = 3	9.0	18.2	1.1	17	5

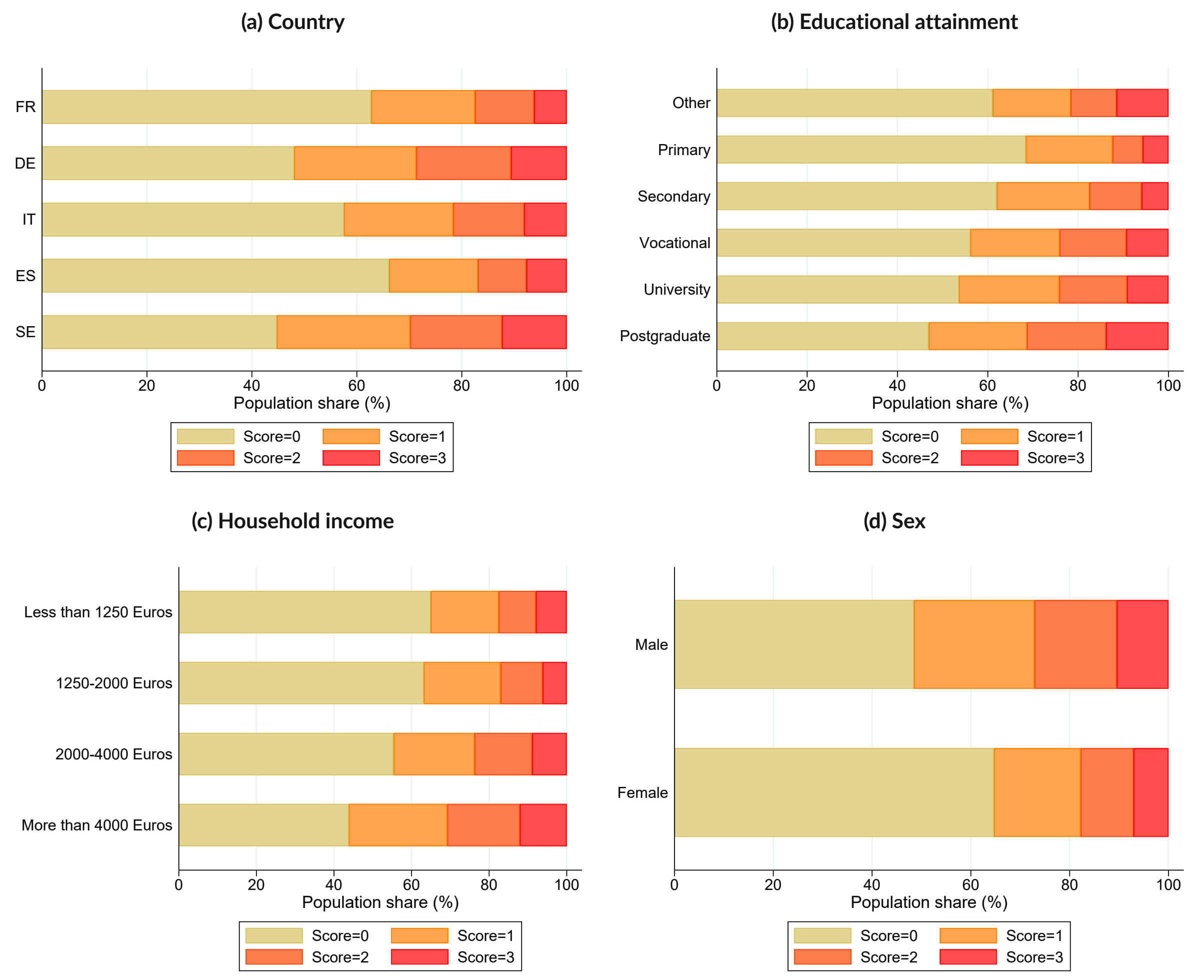
Notes: This table describes the results from the Cognitive Reflection Test for different samples. Panel A shows the shares of correct responses for each individual question. Panel B shows the total scores from all three questions. The sample size is 5,541 for COME-HERE, 44,558 for Brañas Garza et al. (2019) meta-study, 191 for Brañas Garza et al. (2012), 3,428 for Frederick (2005) total sample, and 138 for the Spanish sample in Frederick (2005).

Table B.3 — CRT results by country

	Share					
	Total	FR	DE	IT	ES	SE
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Individual questions						
Bat & Ball	18.5	10.8	16.3	14.6	15.6	46.7
Machines	32.8	28.3	41.7	34.9	23.6	36.2
Lily pads	30.3	27.1	37.7	30.1	23.8	34.7
Panel B. Total scores						
Score = 0	56.0	63.2	48.1	56.6	65.5	42.8
Score = 1	21.0	18.6	24.2	21.2	17.4	24.9
Score = 2	13.9	11.7	17.6	13.4	9.5	19.1
Score = 3	9.0	6.6	10.1	8.8	7.7	13.2

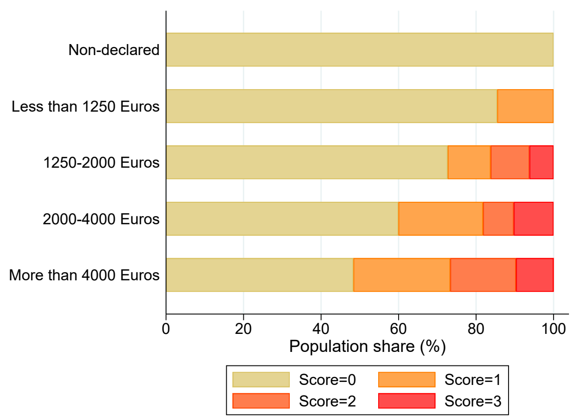
Notes: This table describes the results from the Cognitive Reflection Test for different samples. Panel A shows the shares of correct answers for each individual question. Panel B shows the total score from all three questions. The sample size is 5,541 for the total, 1,183 for France, 1,210 for Germany, 1,231 for Italy, 1,217 for Spain, and 700 for Sweden.

Figure B.2 — CRT scores by categories



Notes: These figures plot CRT score shares for each category in the expanded sample.

Figure B.3 — CRT scores by household income. Within people aged 25-60 and fully employed



Notes: These figures plot CRT score shares for income categories. Only fully-employed individuals aged between 25 and 60 are considered.

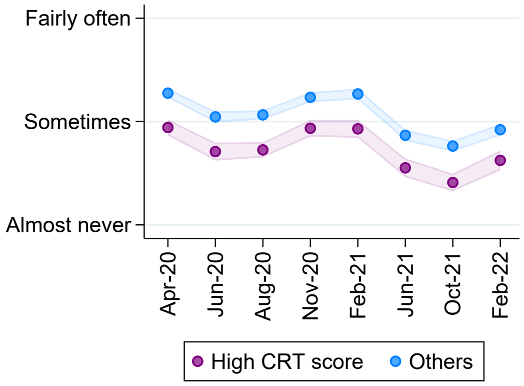
Table B.4 — Group comparison

	Total sample (1)	High CRT score (2)	High vs. Low (3)
Panel A. Baseline characteristics			
Female	.512	.410	-.131***
			(.029)
50+ years	.306	.295	-.014
			(.027)
Employed	.971	.985	.018
			(.020)
Household income 2000+ Euros	.617	.705	.114***
			(.028)
University Education	.506	.562	.072***
			(.029)
Northern Europe	.341	.465	-.161***
			(.029)
Panel B. Attitudes			
Risk (willigness to accept)	.449	.419	-.055***
			(.015)
Patience	.605	.693	.087***
			(.022)
Trust:			
in other people	.443	.456	.007
			(.015)
in other's fairness	.489	.506	.012
			(.014)
in other's helpfulness	.579	.572	-.010
			(.013)
Luck matters (normative)	.441	.412	-.019
			(.018)
Panel C. Perceptions			
Equality of Opportunities	.414	.345	-.097***
			(.015)
Luck matters (positive)	.406	.422	.023**
			(.011)

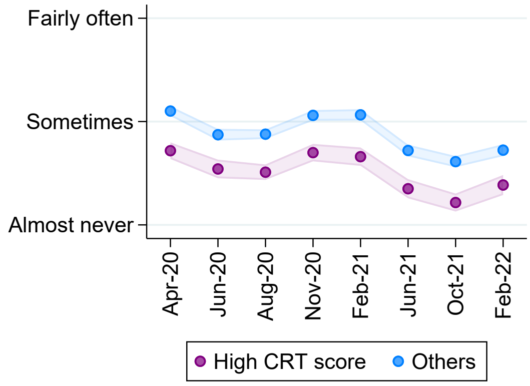
Notes: This table describes the characteristics of the analysis sample. Columns (1) and (2) show means, and column (3) the differences between individuals with CRT scores of 2 and 3 (high score) and those who score 0 and 1 (low score). Northern Europe refers to residents in Germany and Sweden. The differences in Panels B and C control for the basic socio-demographic characteristics included in Panel A. All variables except 'Risk', 'Patience' and 'Luck matters (normative)' were collected in March 2021. 'Patience' was measured in June 2020 (the merged sample size is 1,927), 'Risk' in Nov-Dec 2020 (merged sample size of 2,471) and 'Luck matters (normative)' in Feb-Mar 2022 (merged sample size of 1,711). The sample size is 2,511 in all rows, except for the variables collected other than in March 2021 (in which case the sample is restricted to the observations that can be merged). Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure B.4 — Concerns about COVID-19

(a) Catching COVID-19



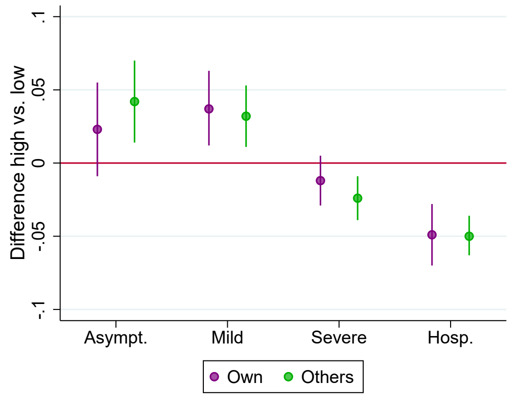
(b) Getting severe COVID-19



Notes: These figures plot the mean responses to concerns about COVID-19 throughout the pandemic. Responses were valued as follows: Never (1), Almost never (2), Sometimes (3), Fairly often (4), Very often (5), All the time (6). Individuals with high CRT scores are those who score 2 and 3 in the test. CRT scores were measured in August 2020. Confidence intervals at 95% are shaded. The sample size varies in each wave (see Table A.5), and across groups.

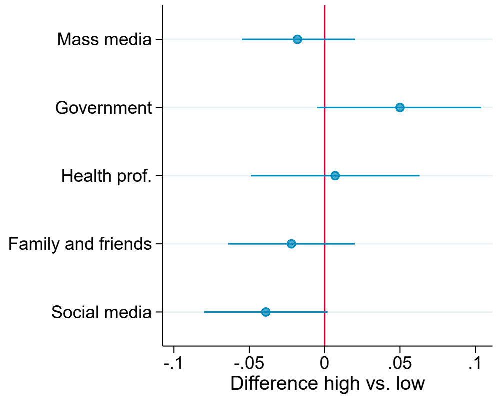
Figure B.5 — Perceptions and information consumption

(a) Assigned probabilities to COVID-19 outcomes



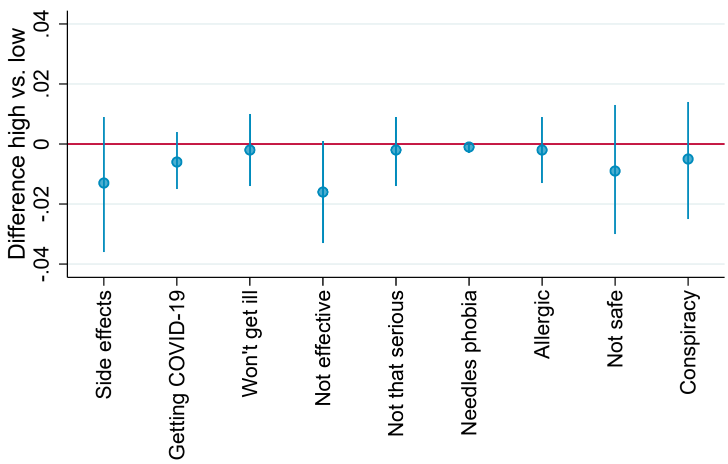
Notes: This figure plots estimates for the differences in the assigned probabilities for COVID-19 outcomes between individuals with CRT scores of 2 and 3 (high score) and those who score 0 and 1 (low score) controlling for socio-demographic characteristics (see the details in Table B.4). Probabilities were reported in August 2020. 'Own' refers to the probabilities for the respondent catching COVID-19. 'Others' refer to probabilities assigned to the general population. The bars are 95% confidence intervals constructed with robust standard errors.

(b) Information sources for COVID-19 pandemic



Notes: This figure plots estimates for the differences in the sources of COVID-19 related information between individuals with CRT scores of 2 and 3 (high score) and those who score 0 and 1 (low score) controlling for socio-demographic characteristics (see the details in Table B.4). Information sources were reported in Feb-Mar 2022. The bars are 95% confidence intervals constructed with robust standard errors.

Figure B.6 — Concerns about COVID-19 vaccines



Notes: These figures plot estimates for the differences in concerns about COVID-19 vaccines between individuals with CRT scores of 2 and 3 (high score) and those who score 0 and 1 (low score) controlling for socio-demographic characteristics (see the details in Table B.4). Concerns were surveyed in Feb-Mar 2022. The bars are 95% confidence intervals constructed with robust standard errors.

C — Vaccine distribution

Figure C.1 — Question used to assess Preferences for Vaccine Distribution in the World

The richest countries of the world are buying about 70% of all vaccines, leaving the poorer and more populated part of the world with the rest. How do you think vaccines should have been purchased?.

- All vaccines should be purchased by an international organization and be distributed according to each country's needs. Countries should contribute to vaccine purchase in proportion to their national wealth.
- All vaccines should be purchased by an international organization and be distributed according each country's contribution to the overall cost of vaccine purchase.
- Countries should be able to buy the vaccines in the market and to distribute them as they wish.

Figure C.2 — Question used to assess Preferences for Vaccine Distribution in the EU

A country's infection rate depends on the policies it follows, for example lockdowns, and its share of clinically-vulnerable individuals. How should the European Union distribute vaccines across its Member States, if there are not enough for everyone?.

- Proportional to the Member State's population, irrespective of the country's lockdown measures.
- Proportional to the Member State's clinically vulnerable population, irrespective of the country's lockdown measures.
- Proportional to the Member State's economic contribution to the European Union budget, irrespective of the country's lockdown measures.
- Proportional to the Member State's stringency of lockdown measures enforced.

Figure C.3 — Question used to assess Preferences for Vaccine Distribution within the country

Some people are more careful in avoiding infection by the SARS-CoV2 virus, for example by wearing a mask, washing their hands, and respecting confinement limitations. We also know that people with previous health conditions are more at risk of developing Covid-19. At the same time front-line workers are more at risk of getting infected. If there were not enough vaccines for everyone in your country, who should take priority?.

- Those who took more care in avoiding infection, with those who took no care last in the queue.
- Everyone has the same right to the vaccine, so I would run a lottery.
- The most clinically vulnerable and the front-line workers, then the second-most clinically vulnerable, and so on, with those who took no care last in the queue, irrespective of their vulnerability.
- The most clinically vulnerable and front-line workers, with the least clinically vulnerable last in the queue.

Table C.1 — Vaccine-distribution questions: labels and classification

Territory	Label	Text	Circumstances	Efforts
World	Market	Countries should be able to buy the vaccines in the market and to distribute them as they wish.	-	Absolute budget
World	Budget contribution	All vaccines should be purchased by an international organization and be distributed according each country's contribution to the overall cost of vaccine purchase.	-	Absolute budget
World	Needs	All vaccines should be purchased by an international organization and be distributed according to each country's needs. Countries should contribute to vaccine purchase in proportion to their national wealth.	Relative budget	-
EU	Budget contribution	Proportional to the Member State's economic contribution to the European Union budget, irrespective of the country's lockdown measures.	-	Budget
EU	Measures enforced	Proportional to the Member State's stringency of lockdown measures enforced.	-	Measures
EU	Population	Proportional to the Member State's population, irrespective of the country's lockdown measures.	Population	-
EU	Vulnerability	Proportional to the Member State's clinically vulnerable population, irrespective of the country's lockdown measures.	Clinically vulnerable population	-
Country	Carefulness	Those who took more care in avoiding infection, with those who took no care last in the queue.	-	Care
Country	Equal	Everyone has the same right to the vaccine, so I would run a lottery.	-	-
Country	Vulnerability+Carefulness	The most clinically vulnerable and the front-line workers, then the second-most clinically vulnerable, and so on, with those who took no care last in the queue, irrespective of their vulnerability.	Clinical vulnerability	Care
Country	Vulnerability	The most clinically vulnerable and front-line workers, with the least clinically vulnerable last in the queue.	Clinical vulnerability	-

Table C.2 — Vaccine-distribution responses

(a) World

	Share
	(1)
Market	29.2
Budget contribution	19.1
Needs	51.7

(b) EU

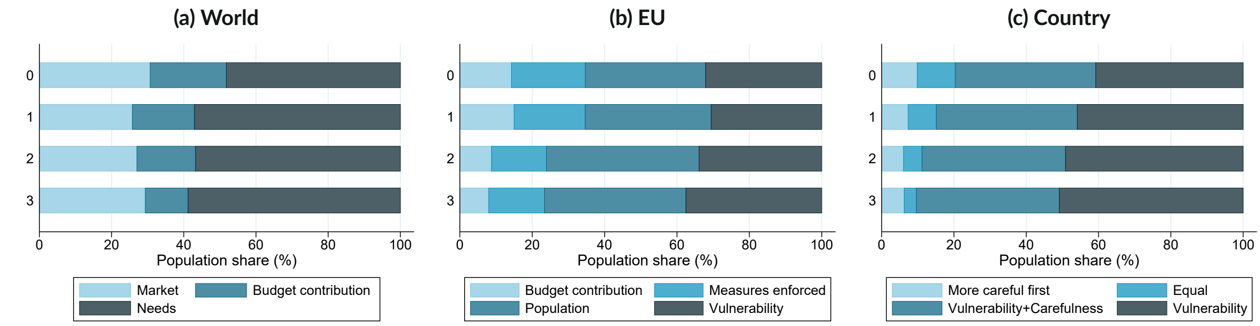
	Share
	(1)
Budget contribution	13.1
Measures enforced	19.2
Population	34.8
Vulnerability	32.9

(c) Country

	Share
	(1)
Carefulness	8.8
Equal	8.6
Vulnerability+Carefulness	38.6
Vulnerability	44.0

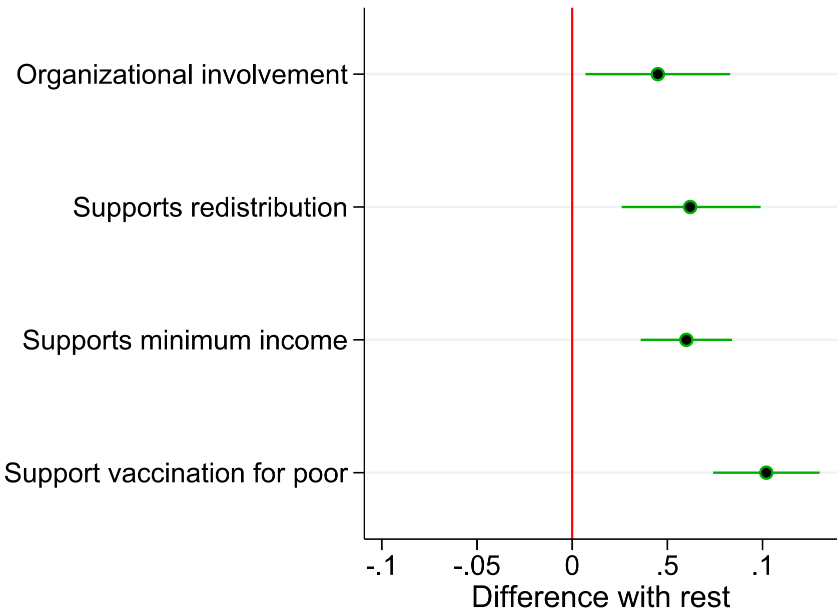
Notes: These tables list the population shares of preferred vaccine-distribution schemes. The labels used, as in the rest of the paper, are explained alongside the question descriptions in Table C.1. The sample size is 4,950 for all tables.

Figure C.4 — CRT scores and Preferences for Vaccine Distribution



Notes: These figures plot the response shares for preferences for vaccine distribution by CRT test scores. CRT scores were measured in August 2020. Preferences for vaccine distribution were measured in March 2021. The sample size is 4,317.

Figure C.5 — Correlates for vaccine distribution prioritizing circumstances



Notes: This figure plots the differences for social preferences and behaviors between people who declare priority in vaccine distribution according to circumstances for all questions and the rest of population. Support for income redistribution was measured in March 2021. Support for minimum income was measured in June 2021. Organizational participation and support for helping poor countries vaccination were measured in February-March 2022. The bars are 95% confidence intervals constructed with robust standard errors.

D — Additional estimates

Table D.1 — Support for distributional schemes prioritizing circumstances

	(1)	(2)	(3)
$High\_CA$	.286***	.359***	.329***
	(.059)	(.059)	(.060)
Margins for $High\_CA$ dummy at means			
0/3	-.035***	-.042***	-.039***
	(.008)	(.007)	(.007)
1/3	-.062***	-.074***	-.067***
	(.013)	(.012)	(.012)
2/3	-.004	-.005*	-.005*
	(.003)	(.003)	(.003)
3/3	.101***	.122***	.111***
	(.020)	(.019)	(.020)
Socio-demographic		X	X
COVID-19 related			X
N	2,511	2,511	2,511
pseudo-R^2	.005	.456	.459

Notes: This table lists the coefficients and margins from an ordered probit for support for vaccine-distribution schemes prioritizing circumstances on a dummy for CRT scores of 2 and 3. The mean of the dependent variable is 1.97. The margins are estimated at the means of all of the other covariates. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table D.2 — Preferences for Vaccine Distribution in the World

Multinomial Logit

	(1)	(2)	(3)
Market			
$High\_CA$	.022	-.119	-.148
	(.132)	(.128)	(.131)
Budget contribution			
$High\_CA$	-.382**	-.461***	-.402***
	(.153)	(.151)	(.151)
Socio-demographic		X	X
COVID-19 related			X
N	2,511	2,511	2,511
pseudo-R^2	.002	.458	.463

Notes: This table lists the coefficients from a multinomial logit for preferences for vaccine distribution in the World on a dummy for CRT scores of 2 and 3. Needs is the base outcome. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Margins for $High\_CA$ dummy

Market	.027	.004	-.005
	(.025)	(.025)	(.024)
Budget contribution	-.063***	-.066***	-.054**
	(.023)	(.023)	(.023)
Needs	.037	.063**	.060**
	(.029)	(.026)	(.026)

Notes: This table lists the estimates of the response margins for a dummy for CRT scores of 2 and 3 in a multinomial logit for preferences for vaccine distribution in the World. The sample is that used for the multinomial logit. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table D.3 — Preferences for Vaccine Distribution in the EU

Multinomial Logit

	(1)	(2)	(3)
Budget contribution			
$High\_CA$	-.694***	-.697***	-.640***
	(.218)	(.199)	(.197)
Measures enforced			
$High\_CA$	-.331**	-.402**	-.346**
	(.157)	(.163)	(.166)
Population			
$High\_CA$	.005	.050	.064
	(.129)	(.130)	(.132)
Socio-demographic		X	X
COVID-19 related			X
N	2,511	2,511	2,511
pseudo-R^2	.004	.461	.464

Notes: This table reports the coefficients from a multinomial logit for preferences for vaccine distribution in the EU on a dummy for CRT scores of 2 and 3. Vulnerability is the base outcome. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Margins for $High\_CA$ dummy

Budget contribution	-.081***	-.076***	-.071***
	(.031)	(.024)	(.023)
Measures enforced	-.030	-.042*	-.036
	(.022)	(.022)	(.022)
Population	.058**	.069***	.066***
	(.026)	(.025)	(.025)
Vulnerability	.054**	.049**	.041*
	(.025)	(.024)	(.025)

Notes: This table reports the estimated response margins for a dummy for CRT scores of 2 and 3 in a multinomial logit for preferences for vaccine distribution in the EU. The sample is that used for the multinomial logit. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table D.4 — Preferences for Vaccine Distribution within the country

Multinomial Logit

	(1)	(2)	(3)
Carefulness			
$High\_CA$	-.572***	-.688***	-.567***
	(.207)	(.209)	(.211)
Equal			
$High\_CA$	-.915***	-1.012***	-.968***
	(.237)	(.234)	(.236)
Vulnearability+Carefulness			
$High\_CA$	-.134	-.200	-.182
	(.128)	(.122)	(.123)
Socio-demographic		X	X
COVID-19 related			X
N	2,511	2,511	2,511
pseudo-R^2	.005	.461	.465

Notes: This table reports the coefficients from a multinomial logit for preferences for vaccine distribution within the country on a dummy for CRT scores of 2 and 3. Vulnerability is the base outcome. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Margins for $High\_CA$ dummy

Carefulness	-.038**	-.043**	-.033*
	(.018)	(.018)	(.018)
Equal	-.065***	-.067***	-.065***
	(.020)	(.019)	(.019)
Vulnerability+Carefulness	.023	.016	.014
	(.028)	(.026)	(.027)
Vulnerability	.080***	.094***	.084***
	(.028)	(.026)	(.026)

Notes: This table reports the estimated response margins for a dummy for CRT scores of 2 and 3 in a multinomial logit for preferences for vaccine distribution within the country. The sample is that used for the multinomial logit. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table D.5 — Total support for distributional schemes prioritizing circumstances

	(1)	(2)	(3)	(4)	(5)	(6)
$High\_CA$	.150***	.117***	.224**	.177***	.118***	.125***
	(.039)	(.026)	(.099)	(.046)	(.038)	(.033)
$High\_CA$ *	-.059					
Male dummy	(.050)					
$High\_CA$ *		.003				
* 60+ years dummy		(.090)				
$High\_CA$ *			-.120			
* Employed dummy			(.102)			
$High\_CA$ *				-.088		
* 2000+ EUR dummy				(.054)		
$High\_CA$ *					-.001	
* University dummy					(.049)	
$High\_CA$ *						-.019
* North Europe dummy						(.049)
N	2,511	2,511	2,511	2,511	2,511	2,511
R^2	.078	.077	.078	.078	.077	.077

Notes: lists the coefficients from linear-probability models on total support for vaccine distribution schemes that focus on circumstances on a dummy for CRT scores of 2 and 3, and its interaction with a set of dummies. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. The male dummy is 1 for men, the 60+ years dummy 1 for those aged 60 years or more, the Employed dummy 1 for those employed in full-time jobs, the 2000+ EUR dummy 1 for those residing in households with total income greater than or equal to 2000 Euros, the University dummy 1 for University and postgraduate education, and the North Europe dummy 1 for individuals living in Germany and Sweden. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

E — Robustness checks

Table E.1 — Total support for distributional schemes prioritizing circumstances Alternative high-cognition group

	LPM			Probit	Margins
	(1)	(2)	(3)	(4)	(5)
$High\_CA$	.118***	.113***	.098***	.269***	.090***
	(.038)	(.035)	(.035)	(.096)	(.032)
Socio-demographic		X	X	X	X
COVID-19 related			X	X	X
N	2,511	2,511	2,511	2,511	2,511
R^2/pseudo-R^2	.005	.061	.070	.058	-

Notes: This table lists the coefficients for total support for vaccine-distribution schemes that focus on circumstances on a dummy for CRT scores of 3. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317. Columns 1 to 3 report estimates from a linear-probability model, and column 4 those from a probit model. Column 5 lists the marginal effects at the mean. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table E.2 — Support for distributional schemes prioritizing circumstances Alternative high-cognition group

	(1)	(2)	(3)
$High\_CA$	.336***	.333***	.290***
	(.084)	(.083)	(.084)
Margins for $High\_CA$ dummy at means			
0/3	-0.041***	-0.040***	-0.034***
	(0.011)	(0.010)	(0.010)
1/3	-0.073***	-0.069***	-0.060***
	(0.018)	(0.017)	(0.017)
2/3	-0.005	-0.005	-0.004
	(0.003)	(0.003)	(0.003)
3/3	.119***	0.114***	0.098***
	(0.030)	(0.028)	(0.028)
Socio-demographic		X	X
COVID-19 related			X
N	2,511	2,511	2,511
pseudo-R^2	.003	.453	.457

Notes: This table lists the coefficients and margins from an ordered probit for support for vaccine-distribution schemes prioritizing circumstances on a dummy for CRT scores of 3. The mean of the dependent variable is 1.97. The margins are estimated at the means of all of the other covariates. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table E.3 — Total support for distributional schemes prioritizing circumstances
Categorical CRT scores

	LPM			Probit	Margins
	(1)	(2)	(3)	(4)	(5)
CRT score=1	.034	.078***	.076***	.222***	.073***
	(.034)	(.027)	(.027)	(.080)	(.027)
CRT score=2	.094***	.149***	.140***	.410***	.139***
	(.032)	(.031)	(.031)	(.089)	(.031)
CRT score=3	.140***	.161***	.145***	.410***	.139***
	(.040)	(.037)	(.037)	(.103)	(0.036)
Socio-demographic		X	X	X	X
COVID-19 related			X	X	X
N	2,511	2,511	2,511	2,511	2,511
R^2/pseudo-R^2	.010	.072	.081	.067	-

Notes: This table lists the coefficients for total support for vaccine-distribution schemes that focus on circumstances on a categorical variable for CRT scores. The omitted category is a CRT score of 0. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317. Columns 1 to 3 report estimates from a linear-probability model, and column 4 those from a probit model. Column 5 lists the marginal effect at the mean. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table E.4 — Total support for distributional schemes prioritizing circumstances
Alternative outcome classification

	LPM			Probit	Margins
	(1)	(2)	(3)	(4)	(5)
$High\_CA$	.032**	.039***	.034**	.215**	.032**
	(.013	(.014)	(.014)	(.091)	(.013)
Socio-demographic		X	X	X	X
COVID-19 related			X	X	X
N	2,511	2,511	2,511	2,511	2,511
R^2/pseudo-R^2	.002	.025	.028	.048	-

Notes: This table lists the coefficients for total support for a restrained classification of vaccine-distribution schemes that focus on circumstances on a dummy for CRT scores of 2 and 3. The dependent variable is 1 when all three vaccine distribution schemes favor circumstances. Vaccine-distribution schemes that are considered to favor circumstances are 'Needs' in the case of distribution in the world, and 'Vulnerability' in the EU and within the country. The mean of the dependent variable is 0.084. Columns 1 to 3 report estimates from a linear-probability model, and column 4 those from a probit model. Column 5 reports the marginal effect at the mean. The socio-demographic controls are sex, age group, educational attainment, occupational status, household income, and country of residence. The COVID-19 related controls account for the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table E.5 — Total support for distributional schemes prioritizing circumstances Adding/removing controls (scheme convenience)

	(1)	(2)	(3)	(4)	(5)
$High\_CA$	.117***	.114***	.117***	.112***	.110***
	(.023)	(.022)	(.023)	(.022)	(.022)
(+) Medical conditions		X			X
(+) Front-line worker			X		X
(+) Following recommendations				X	X
Wald test	-	.784	.019	3.458	3.046
p-value	-	.376	.890	.063	.081
N	2,511	2,511	2,511	2,511	2,511
R^2	.077	.084	.077	.085	.091

Notes: This table lists the coefficients for total support for vaccine-distribution schemes that focus on circumstances on a dummy for CRT scores of 2 and 3. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317. All columns report estimates from a linear-probability model. Columns 1 to 3 report estimates adding/removing controls to the main specification. The main specification controls are sex, age group, educational attainment, occupational status, household income, country of residence, history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Declared medical conditions (individual dummies for cancer, lung disease, heart disease and diabetes) were collected in April 2020. Front-line are workers in the health system, as measured in April 2020. The declared degree of adherence to recommendations to prevent the spread of COVID-19 were measured via a 7-point Likert scale in March 2021. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Wald test statistics for the equality of the $High\_CA$ coefficient to that in the main specification are reported, with the associated p-values.

Table E.6 — Total support for distributional schemes prioritizing circumstances Adding/removing controls (cost perception)

	(1)	(2)	(3)	(4)	(5)
$High\_CA$	.117***	.122***	.117***	.112***	.112***
	(.025)	(.022)	(.023)	(.023)	(.023)
(-) Concerns COVID-19		X			
(+) Concerns catching/serious COVID-19			X		X
(+) Perceptions COVID-19 probabilities				X	X
Wald test	-	2.082	.100	2.805	2.987
p-value	-	.149	.751	.094	.084
N	2,511	2,511	2,511	2,511	2,511
R^2	.077	.076	.078	.079	.081

Notes: This table lists the coefficients for total support for vaccine-distribution schemes that focus on circumstances on a dummy for CRT scores of 2 and 3. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317. All columns report estimates from a linear-probability model. Column 1 reports the estimates in our main specification and columns 2 to 5 those adding/removing controls to the main specification. The main specification controls are sex, age group, educational attainment, occupational status, household income, country of residence, history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Concern about catching COVID-19 was measured in March 2021. The assigned probabilities for the COVID-19 outcomes were measured in August 2020. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Wald test statistics for the equality of the $High\_CA$ coefficient to that in the main specification are reported, with the associated p-values.

Table E.7 — Total support for distributional schemes prioritizing circumstances Adding/removing controls (prosociality)

	(1)	(2)	(3)	(4)	(5)
$High\_CA$	.117***	.113***	.085***	.113***	.118***
	(.025)	(.023)	(.022)	(.023)	(.023)
(+) Luck matters		X			
(+) No equality of opportunities			X		
(+) Hypothetical donation				X	
(+) Trust					X
Wald test	-	2.962	25.842	1.208	.345
p-value	-	.085	.000	.272	.557
N	2,511	2,511	2,511	2,511	2,511
R^2	.077	.080	.105	.078	.080

Notes: This table lists the coefficients for total support for vaccine-distribution schemes that focus on circumstances on a dummy for CRT scores of 2 and 3. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317. All columns report estimates from a linear-probability model. Column 1 reports the estimates in our main specification, and columns 2 to 5 those adding/removing controls to the main specification. The main specification controls are sex, age group, educational attainment, occupational status, household income, country of residence, history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Perceptions about role of luck (as opposed to effort), perceptions about equality of opportunity, hypothetical donation to 'a good cause', and trust in people, other's fairness and other's helpfulness were measured in March 2021. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Wald test statistics for the equality of the $High\_CA$ coefficient to that in the main specification are reported, with the associated p-values.

Table E.8 — Total support for distributional schemes prioritizing circumstances Adding/removing controls (prosociality)

	(1)	(2)	(3)
$High\_CA$	.117***	.080***	.092***
	(.025)	(.023)	(.022)
(+) Luck matters		X	
(+) No equality of opportunities		X	
(+) Hypothetical donation		X	
(+) Trust		X	
(+) Prosociality factors			X
Wald test	-	25.622	18.190
p-value	-	.000	.000
N	2,511	2,511	2,511
R^2	.077	.115	.103

Notes: This table lists the coefficients for total support for vaccine-distribution schemes that focus on circumstances on a dummy for CRT scores of 2 and 3. The dependent variable is 1 when all three vaccine-distribution schemes favor circumstances. The mean of the dependent variable is 0.317. All columns report estimates from a linear-probability model. Column 1 reports the estimates in our main specification, and columns 2 to 5 those adding/removing controls to the main specification. The main specification controls are sex, age group, educational attainment, occupational status, household income, country of residence, the history of COVID-19 infection, concern about getting it, and confidence in the national health system to cope with the pandemic. Perceptions about role of luck (as opposed to effort), perceptions about equality of opportunity, hypothetical donation to 'a good cause', and trust in people, other's fairness and other's helpfulness were measured in March 2021. The prosociality factors comes from a PCA on all additional controls included in this table. Robust standard errors appear in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Wald test statistics for the equality of the $High\_CA$ coefficient to that in the main specification are reported, with the associated p-values.