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DP18086

**GOVERNMENT PERFORMANCE AND  
DEMOCRACY: SURVEY EXPERIMENTAL  
EVIDENCE FROM 12 COUNTRIES  
DURING COVID-19**

Michael Becher, Nicolas Longuet Marx, Vincent Pons, Sylvain Brouard, Martial Foucault, Vincenzo Galasso, Eric Kerrouche, Sandra Leon Alfonso and Daniel Stegmueller

**POLITICAL ECONOMY**

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## Abstract

Crises of the magnitude of the Covid-19 pandemic may plausibly affect deep-seated attitudes of a large fraction of citizens. In particular, outcome-oriented theories imply that leaders' performance in response to such adverse events shapes people's views about the government and about democracy. To assess these causal linkages empirically, we use a pre-registered survey experiment covering 12 countries and 22,500 respondents during the pandemic. Our design enables us to leverage exogenous variation in evaluations of policies and leaders with an instrumental variables strategy. We find that people use information on both health and economic performance when evaluating the government. In turn, dissatisfaction with the government decreases satisfaction with how democracy works, but it does not increase support for non-democratic alternatives. The results suggest that comparatively bad government performance mainly spurs internal critiques of democracy.

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# Government Performance and Democracy: Survey Experimental Evidence from 12 Countries during Covid-19\*

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## Abstract

Crises of the magnitude of the Covid-19 pandemic may plausibly affect deep-seated attitudes of a large fraction of citizens. In particular, outcome-oriented theories imply that leaders' performance in response to such adverse events shapes people's views about the government and about democracy. To assess these causal linkages empirically, we use a pre-registered survey experiment covering 12 countries and 22,500 respondents during the pandemic. Our design enables us to leverage exogenous variation in evaluations of policies and leaders with an instrumental variables strategy. We find that people use information on both health and economic performance when evaluating the government. In turn, dissatisfaction with the government decreases satisfaction with how democracy works, but it does not increase support for non-democratic alternatives. The results suggest that comparatively bad government performance mainly spurs internal critiques of democracy.

Keywords: democracy, democratic dissatisfaction, public health, economy, Covid-19, survey experiment

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\*Author contributions: Michael Becher, Nicolas Longuet Marx, and Vincent Pons did the conceptualization of the research question and of the experiment, the data curation, the formal analysis, and the writing of the paper; Sylvain Brouard, Martial Foucault, Vincenzo Galasso, Eric Kerrouche, Sandra León Alfonso, and Daniel Stegmueller contributed to designing the survey questionnaire and to writing; Daniel Stegmueller also contributed to statistical analysis. The anonymous preregistered analysis plan for the experiment is available from the University of Pennsylvania's Credibility Lab at <https://aspredicted.org/blind.php?x=5p6xd9>. The authors thank Thomas Van Casteren for excellent research assistance. For comments, they are especially grateful to Anne-Marie Therese Jeannet, Hanspeter Kriesi, Pavlos Vasilopoulos, and panelists at APSA 2021, the IAST-Sciences Po workshop, and the Barcelona 2022 "Pandemic Crisis and Democratic Preferences workshop".

The Covid-19 pandemic has generated dramatic health and economic disruptions, and it has tested governments' capacity to deliver in difficult times. To assess the full ramifications of such crises, scholars should also consider effects on ordinary people's views about their political leaders and even democracy as a whole (e.g., Achen and Bartels, 2016; Amat et al., 2020; Arceneaux et al., 2020; Bermeo, 2003; Bol et al., 2021; De Bromhead, Eichengreen and O'Rourke, 2013; Esaiasson et al., 2021; Kritzinger et al., 2021; Lupu and Zechmeister, 2021; Malhotra and Kuo, 2008). Specifically, when people observe that their elected leaders are comparatively bad at addressing a crisis that puts their lives and livelihoods at risks, they may also blame the way in which democracy works in their country. Going one step further, they may even start supporting alternative, non-democratic regime types. To what extent does this happen? While outcome-oriented theories posit a causal link between perceived government performance on one hand and the evaluation of political leaders and of democracy on the other, it is hard to estimate the strength of this relationship empirically. In this paper, we take a step toward addressing this question. We examine causal linkages between perceived government performance and democratic satisfaction and support by using a survey experiment conducted in 12 countries during the Covid-19 pandemic and a design-based instrumental variable approach.

Faced with the worst pandemic in a century, many commentators and political leaders expressed worries about the health of democracy. For instance, U.S. president Joe Biden asserted that democracy has to prove that it "still works."<sup>1</sup> Seemingly in line with his concern, survey data showed a statistically significant correlation between people's satisfaction with the incumbent government, their satisfaction with democracy, and support for non-democratic alternatives. Street protests that took place during the Covid-19 crisis did not just criticize pandemic policies but the political system as a whole, and some consolidated democracies such as Germany saw the most serious efforts to overthrow the elected government in decades (Plümper, Neumayer and Pfaff,

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<sup>1</sup> Joe Biden's address to Joint Session of Congress, April 29, 2021.

2021; Solomon and Bennhold, 2022).

However, the literature does not agree on the causal relevance of people's views about how well their government is handling a crisis. The large body of work on popular support for democracy frequently discusses the endogeneity problem involved in assessing causal claims about the effect of government performance evaluations on democratic attitudes (for example, Norris 2011, ch. 10; Magalhães 2014, 80; Bol et al. 2021; Claassen and Magalhães 2022; Robinson 2006). Reverse causality is a first concern (Kostelka and Blais, 2018). Dissatisfaction with or rejection of democracy may drive negative views of specific governments and their policies, and the policy response to crises such as the Covid-19 pandemic can be conditioned by pre-existing democratic norms and institutions (Engler et al., 2021). A second endogeneity concern is omitted variable bias. For instance, protests and grievances voiced by populist parties, which are stronger where support for mainstream parties is weaker (Plümper, Neumayer and Pfaff, 2021), may drive negative attitudes toward governments while also decreasing satisfaction in the democratic system more broadly. In sum, the observed correlations between these variables may not reflect causality, which calls for a source of exogenous variation (Angrist and Pischke, 2008; Ashworth, Berry and de Mesquita, 2021).

Enduring theoretical disagreements compound these empirical challenges. One perspective is that satisfaction and support for democracy in consolidated democracies should in general be insensitive to short-run performance, because these are deep-seated attitudes primarily determined by socialization and early life experiences (e.g., Easton, 1975; Fuchs-Schündeln and Schündeln, 2015; Inglehart and Welzel, 2005). In contrast, the outcome-oriented perspective stresses that large-scale crises can provide a critical test of leaders' ability. As a result, people may grow less satisfied with democracy and more open to non-democratic alternatives if they are dissatisfied with the government's response to a crisis. Extending existing theories (Meirowitz and Tucker, 2013), we argue that a novel empirical implication of the performance-based perspective is that both health and the economy should shape people's satisfaction with how the government is handling a dual crisis such as Covid-19. In turn, lower satisfaction

with the government can reduce satisfaction with democracy. These implications are linked. The existence of two separate performance dimensions enhances learning about the functioning of democracy.

We turn to a comparative survey including 22,500 respondents to test these implications. The survey was administered during the pandemic in 12 countries which accounted for more than two thirds of the officially reported Covid-19 related deaths at that time (Dong, Du and Gardner, 2020). Our pre-registered analysis draws on an embedded survey experiment which randomized vignettes about the pandemic. To provide a strict test and mitigate experimenter demand effects, the text made no mention of democracy. Rather, the treatments simply provided information on and made salient the comparative magnitude of the health and economic crisis in the country. In some treatment arms, the vignettes attributed blame or praise to the government. The experiment generated exogenous variation in (otherwise endogenous) evaluations of policies and leaders. Using a design-based instrumental variable approach (where instruments are exogenous by construction), we estimate, first, how individual evaluations of health and economic measures impact satisfaction with the government, and, second, whether satisfaction with the government affects democratic attitudes.

Our analysis yields three key results. First, health and economic concerns are about equally important in shaping assessments of government performance in the pandemic. This contrasts with prior evidence showing that heuristics sometimes lead people to substitute the part for the whole when evaluating the incumbent (Healy and Lenz, 2014). A significant strand of scholarship emphasizes the importance of the economy for the electoral fate of incumbents (Achen and Bartels, 2016; Duch and Stevenson, 2008). During a pandemic, health evaluations may plausibly trump economic ones. Indeed, some studies report that health was of primary importance for evaluations of the government during the pandemic (Kritzing et al., 2021; Schraff, 2021). Overall, we find that people in the experiment used information on both health and the economy when judging political leadership. The result is consistent with a rational model of learning, and it provides additional support for the argument that voters may use



exogenous shocks to learn about leaders' capacity to handle them (Ashworth, Bueno de Mesquita and Friedenber, 2017).<sup>2</sup>

Second, we find that there is a large pass-through from satisfaction with the government to satisfaction with democracy. Concretely, a one point decrease in satisfaction with the head of government reduces satisfaction with democracy by about half a point. Based on our research design, we conclude that this effect is unlikely to reflect reverse causation or omitted variable bias. Even in consolidated democracies, the buck does not stop with the incumbent. People who blame the government for bad management of the pandemic also become more critical of democracy in their country.

Third, dissatisfaction does not immediately translate into higher support for non-democratic alternatives. In contrast to OLS estimates between satisfaction with democracy and support for this regime, we fail to reject the null hypothesis of no effect when leveraging our experimental variation.

Taken together, the results suggest that comparatively bad performance in the pandemic spurred internal critiques of democracy rather than increasing support for alternative regime types. In a sense, democratic regime principles remained the main game in town. A hopeful view is that dissatisfaction with how democracy works would deepen democracy through fundamental reform. However, dissatisfaction with democracy is also correlated with the populist vote (e.g. Arzheimer, 2009). While populists usually pitch their challenge as an effort to save or restore true democracy rather than getting rid of it, their empowerment can eventually result in democratic backsliding (Müller, 2021; Graham and Svobik, 2020).

As in other research generating exogenous variation through experiments or searching for plausibly exogenous instruments in the wild, our instruments meaningfully shift

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<sup>2</sup> A separate literature on spatial models of voting also looks at health policy as one of the policy dimensions on which voters judge candidates (e.g., Tomz and Van Houweling 2008). How much weight this dimension receives will differ across voters and contexts. For an example of comparative pre-pandemic research that finds no effect of health outputs on satisfaction with democracy, see Claassen and Magalhães (2022).

the endogenous treatment variables of interest, like satisfaction with the government leader, but do not explain most of their variation (Angrist and Pischke 2008, 166-172; Gerber, Green and Shachar 2003). Working in difficult settings for testing causal claims, the goal of the design-based instrumental variable approach is to replace an implausible assumption (no unobserved confounders) with “a plausible one, albeit not a certain one” (Imbens and Rosenbaum, 2005, 110). There is no single right way to study the causal linkages shaping people’s views about democracy, and different research designs require different trade-offs.<sup>3</sup> The main limitation of the instrumental variable approach may be the generalizability of the results beyond the sub-population of people who respond to the experimental messages. We believe that it was a trade-off worth making in this study (we also provide evidence on how steep it is). On the positive side, our designed-based approach enabled us to tackle our research questions without requiring strong assumptions about selection on observables. Importantly, our results are robust to different ways of leveraging the experimental variation.

## Support for leaders and democracy in hard times

A long tradition of scholarship argues that people’s support for democracy “will normally be independent of outputs and performance in the short run” (Easton, 1975, 445). In line with this view, theories of electoral accountability commonly assume that people blame the government for poor performance, not the political system itself (Duch and Stevenson, 2008). However, Easton (1975, 446) and others also argue that,

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<sup>3</sup> Another approach analyzes differences in attitudes around lockdowns (Bol et al., 2021). While insightful, such an approach does not enable to distinguish health from economic performance. In addition, the timing of lockdowns is not necessarily exogenous (De Vries et al., 2021; Schraff, 2021). Some studies leverage micro-level panel data (Amat et al., 2020; Kritzinger et al., 2021). However, even with such data, it may be difficult to rule out alternative explanations based on time-varying confounders (Angrist and Pischke, 2008).

in the long-run, government performance is likely to shape democratic support. Moreover, he suggests that unusually poor government performance can occasionally lead people to update their beliefs about democracy relatively quickly. Some pre-pandemic evidence supports this view (e.g., Armingeon and Guthmann, 2014; Claassen and Magalhães, 2022; Magalhães, 2014; Norris, 2011), but these observed correlations are hard to interpret causally.

Building on this literature, we examine the causal linkages between information on government performance, evaluations of policies and leaders, and support for democracy in the Covid-19 pandemic. The pandemic put people’s well-being at risk around the world, offering a good test case to assess outcome-based views of democratic politics. While the onset of the pandemic was an exogenous shock, its severity, both in terms of health and economic outcomes, was at least in part a result of public policies in place before the crisis or enacted in response to it. To be clear, our goal is not to estimate the overall impact of the pandemic on public attitudes toward government and democracy.<sup>4</sup> Rather, we aim to assess empirical implications derived from an outcome-based framework in which people use available information to learn about the capacity of democracy to solve pressing problems.

Existing theoretical work establishes that when people do not directly observe incumbent politicians’ quality and effort, it can be rational for them to make inferences from governance outcomes. From the perspective of citizens, these outcomes are the

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<sup>4</sup> For an example of a study interested in the compound effect of the pandemic, see Esaiasson et al. (2021). While we focus on the effects of information regarding the magnitude of the health and economic crises and the policy response to them, satisfaction with government may also have been affected by other factors such as restrictions of civil liberties. Such factors would need to be taken into account to measure the full effects of the pandemic on satisfaction with the government and, in turn, on attitudes towards democracy, particularly since there may have been a trade-off between the protection of civil liberties and governments’ effectiveness in flattening the curve. Our data do not allow us to analyze such trade-off, which has been explored by other studies (e.g., Alsan et al., 2020).

“realization of a statistical experiment that generates information about the incumbent” (Ashworth, Bueno de Mesquita and Friedenbergr 2017, 96; also see Duch and Stevenson 2008). Such updating may be particularly likely to take place during a crisis like the Covid-19 pandemic. Crises critically test leaders’ ability to take fast decisions with large stakes, and they may reveal deficits or strengths of political leadership that are less visible during normal times. A crisis can also reveal comparative deficits in preparedness that in turn motivate a re-evaluation of the quality of political leadership (Ashworth, Bueno de Mesquita and Friedenbergr, 2018). The argument is not that we should expect blanket condemnation of leaders during a crisis, but that relative performance is informative. As suggested by scholarship on benchmarking and accountability, information that compares a country’s performance to other countries or previous crises, such as the one that our treatments provided, may be particularly useful to evaluate the performance of the government (Aytar, 2018; Kayser and Peress, 2012).

While in standard theories of electoral accountability voters are only concerned with learning about the quality of elected leaders, they may also be uncertain about the ability of a given democratic system to produce good leaders (Duch and Stevenson, 2008) and to control moral hazard (Ferejohn, 1986). In crises such as the Covid-19 pandemic, people’s very lives and livelihoods are on the line. Therefore, the responsiveness of the government to their interests may be considered “the ultimate measure of whether the citizenry has a voice” (Eichengreen, 2018, xi). We argue that citizens may interpret leadership failures in such periods as a symptom of broader political issues. Our argument extends the theoretical intuition of models in the spirit of Meirowitz and Tucker (2013) by considering two salient dimensions: health and the economy. The logic is developed formally using a Bayesian model of learning in Appendix Section A. Here, we focus on the theoretical intuition and its observable implications.

Our framework assumes that the groups of policymakers responsible for health and economic policies are partially differentiable. For instance, in addition to chief executives (presidents or prime ministers), it is natural to think of finance ministers on

one side and health ministers on the other side, even if they both formally respond to the chief executive. During the pandemic, health ministers and health officials were in the public spotlight as rarely before, from Anthony Fauci in the U.S. to Olivier Véran in France and Jens Spahn in Germany, and they had to make key decisions. Moreover, the design, coordination, and implementation of policies addressing the crisis, like lockdowns, frequently also involved state-level premiers or governors.

This two-dimensional framework has two key implications. First, we expect people to use information on both health and economic outcomes when evaluating governments and democratic institutions. In contrast to heuristics in which people substitute the part for the whole (Healy and Lenz, 2014) and focus on a single dimension (Schraff, 2021), we expect them to consider both economic and health aspects. Empirically, showing that people respond to performance on all relevant dimensions would also indicate that they are not blindly blaming their government and political system for the crisis.

Second, if a country performs poorly on both dimensions, it is more difficult to dismiss bad outcomes as caused by a single actor that can be replaced in the next election. Rather than simply making an inference about the incumbent chief executive, people may conclude that democracy does not function as well as they previously thought. Conversely, if performance is comparatively good, there is more reason to positively update not just about the incumbent government but about democracy in their country.<sup>5</sup>

The argument holds constant the probability of being exposed to relevant information. Rather than trying to estimate the impact of exposure, we controlled for it through the experimental design. As we discuss in the next section, all respondents received some information, and randomization ensures that pre-experimental exposure

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<sup>5</sup> Another interpretation is that even if there is a single encompassing policymaker and people receive two separate performance signals on that individual, they can still learn more deeply about the ability of democracy in their country to select a good leader.

and any other possible confounders are exogenous to the messages.

In sum, our theoretical framework implies two key hypotheses that we test in the empirical analysis:

- **H1:** When citizens evaluate the government in the pandemic, both health and economic performance matter: lower perceived performance on either dimension decreases satisfaction with the government.
- **H2:** Higher dissatisfaction with government performance during the pandemic leads to higher dissatisfaction with democracy.

## Data and experimental design

Our experiment was embedded in a cross-country survey conducted simultaneously in 12 countries in July 2020. For each country, Table 1 indicates the exact dates at which the survey was administered, the number of respondents, and the Covid-19 mortality rate at the time of the survey. Our experiment includes some of the countries with the highest rates of Covid deaths per capita (e.g., Spain and the U.K.) as well as countries with very low infections and deaths rates (e.g., Australia and New Zealand). This enhances the external validity of our results. All countries except for Brazil are relatively rich, and all are members of the OECD with a long history of democracy. They may thus be considered least likely cases for finding effects on democracy (Lupu and Zechmeister, 2021; Meirowitz and Tucker, 2013).

The surveys were administered in each country’s language on the internet by established commercial polling companies (CSA Research in Australia and in the U.S., Netquest in Spain, and IPSOS in all other countries).<sup>6</sup> All participants gave informed consent to participate. Thanks to quota sampling, the sample is representative of the census population in each country along gender, age, occupation, region, and level of urbanization. Target sample sizes for the experiment were about 2,000 respondents in

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<sup>6</sup> Canada was excluded because the randomization was not implemented properly.

France, Germany, and the U.S., 1,500 in Spain, and 1,000 respondents in the remaining countries. Because treatments were initially not randomized as instructed in France, the survey company ran the correct experiment among a larger sample of respondents, none of whom had participated in the faulty survey.

Table 1: Survey dates, number of observations, and number of Covid-19 deaths per million inhabitants in each country.

	Dates	Sample size	Deaths per million
Australia	July 16, 2020	1,010	4.5
Austria	July 16-20, 2020	1,000	80.1
Brazil	July 16-17, 2020	1,002	357.2
France	July 9-19, 2020	9,081	446.9
Germany	July 16-17, 2020	2,001	109.4
Italy	July 16-17, 2020	1,000	579.8
New Zealand	July 16-20, 2020	1,000	4.5
Poland	July 16-17, 2020	1,000	42.0
Spain	July 6-10, 2020	1,441	604.7
Sweden	July 16-20, 2020	1,000	544.7
U.K.	July 16-17, 2020	1,000	615.7
U.S.	July 17-22, 2020	2,006	423.6
Total		22,541	

*Notes:* The deaths numbers come from the Covid-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (Dong, Du and Gardner, 2020).

## Experimental design

About halfway through the survey, each respondent received two messages, one of four possible messages on health and one of four possible messages on the economy.

The four possible messages on health (resp. the economy) were as follows:

- A positive message on the health (resp. economic) situation in the country, as compared to previous health (resp. economic) crises, without any mention of the government (group TH1 (resp. TE1)).
- A positive message on the health (resp. economic) situation in the country, as compared to previous health (resp. economic) crises, and praising the government for its handling (group TH2 (resp. TE2)).

- A negative message on the health (resp. economic) situation in the country, as compared to previous health (resp. economic) crises, without any mention of the government (group TH3 (resp. TE3)).
- A negative message on the health (resp. economic) situation in the country, as compared to previous health (resp. economic) crises, and blaming the government for its handling (group TH4 (resp. TE4)).

The two messages were cross-randomized, for a total of 16 message combinations. The probability of receiving each of the health (resp. economy) messages was equal to one fourth, resulting in 16 groups of equal size. The messages were written to ensure equivalence among countries and were tailored to each country’s context (e.g., a country’s Covid-19 mortality rate). They were based on factual information, namely Covid-19 and previous pandemic numbers from John Hopkins University, and predicted GDP growth from the April 2020 World Economic Outlook of the IMF. While interviewees can be expected to have had extensive information about health and economic crises before the survey, the messages were designed to, first, make some aspects of these crises and the government’s response salient; and, second, provide factual information about the *relative* magnitude of the crisis (which might have been new information for some respondents). Specifically, we put publicly available information in a comparative and historical perspective, drawing on benchmarking theories of how people evaluate government performance as well as experimental tests thereof (Aytaç, 2018; Kayser and Peress, 2012). None of the messages mentioned democracy or attributes of political regimes.<sup>7</sup>

The full text of all messages is shown in Appendix B. Here, we provide the text of two messages in the U.K. for illustration. The vignette de-emphasizing the gravity of the health situation in the U.K. compared Covid-19 mortality at the time of the survey to the four-times higher mortality during the 1918 Spanish influenza pandemic

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<sup>7</sup> Appendix Table E.1 presents the joint distribution of economic and health treatments. As expected from the design, all 16 groups have equal size.



and the mortality from the 1968 flu:

- *“By the end of June, the total number of deaths due to Covid-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed four times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than Covid-19 worldwide, but it had been largely forgotten.”* (TH1)

By contrast, the U.K. health treatment emphasizing the gravity of the health situation compared the mortality from Covid-19 with the much lower mortality of the flu in a normal year. The government treatment added to this text a cross-national comparison of how the government managed the crisis, in terms of providing tests, masks, and other health supplies, indicating that the government response had been comparatively slow and less successful:

- *“By the end of June, the number of deaths due to Covid-19 in the country was more than 40,000, which is twenty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough tests, masks, and other health supplies for the population. They also pointed out that the government’s response to the health crisis had been slower and less successful than in other countries in the region.”* (TH4)

Inter-temporal comparisons such as the ones in these specific vignettes were designed to shift people’s beliefs about the magnitude of the crisis. Comparisons with the Spanish flu and other epidemics also echoed stories published by the media during the pandemic.<sup>8</sup> Since many policy tools changed over time (though social distancing and

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<sup>8</sup> For example, “Is Covid-19 worse than the 1918 Spanish flu?” (USA Today, 8/14/2020, <https://tinyurl.com/233dncwz>).

masks were by no means new), any discussion of the government’s response was based on contemporary comparisons across borders, as is illustrated by the second vignette.<sup>9</sup> On the economy, the positive treatment contrasted the immediate negative impact of the crisis with a relatively quick recovery predicted by some economists at the time, and the government condition included praise for the stimulus package. The negative treatment focused on the more pessimistic outlook, and the government condition added criticism of government policies. In addition to the cross-randomization of the health and economic statements, which of these two statements the respondent saw first was also randomized.

## Outcome variables

After reading the statements, respondents were asked a range of questions, identical in all countries, about their perception of the seriousness of the crisis, their satisfaction with the health and economic measures undertaken by the government to cope with it, their overall satisfaction with the government head, as well as causally more distant measures concerning their satisfaction with the functioning of democracy and their support for various political regimes. With these questions, our goal was to assess the causal chain linking evaluations of concrete government performance to overall satisfaction with the government and satisfaction with and support for democracy.

We follow a long tradition in political science and distinguish democratic performance from more diffuse ideals and principles (Easton, 1975; Norris, 2011). Satisfaction with democracy is a widely used item that taps into satisfaction with how democracy works in a particular country. Respondents were asked: “How satisfied are you with the way democracy works in your country?” Answers were recorded on a 0 to 10 scale

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<sup>9</sup> The comparison with other countries “in the region” in that vignette was motivated by large regional variation in policy responses (Engler et al., 2021) as well as existing work on benchmarks used by the media (Park, 2019). We refrained from mentioning specific countries with strong connotations (e.g., China) to avoid priming effects unrelated to performance.

(re-scaled to range from 0 to 1 for the analysis), where 0 means not satisfied at all and 10 means completely satisfied. Satisfaction with democracy is widely regarded as an indicator of how people evaluate the performance of a democratic regime in practice (Linde and Ekman, 2003, 405). It falls between “more diffuse support for [...] regime principles and more specific support for regime institutions and political actors” (Kostelka and Blais 2018, 371; also see Norris 2011).

Following previous work, we measure support for democracy as a regime type by using items regularly employed in the *World Values Survey* and other surveys (Linde and Ekman, 2003; Norris, 2011). Respondents read the following text: “There are various types of political systems. What do you think about each as a way of governing this country? For each one, would you say it is a very good, fairly good, fairly bad or very bad way of governing this country?” Then they were asked about four different systems: (i) “Having a strong leader who does not have to bother with parliament and elections”; (ii) rule by experts; (iii) rule by the army; and (iv) a democratic political system.

## Empirical strategy and results

The main empirical analysis sequentially addresses two related research questions.<sup>10</sup> First, how much importance do respondents give to health compared to economic considerations when evaluating the overall performance of the government during the pandemic? Second, do evaluations of government performance affect perceptions and attitudes about democracy, specifically satisfaction with how democracy works and support for different regime types? These questions and related hypotheses explore the impact of variables that are deliberately not directly manipulated by the experiment. It would be unethical and practically difficult to force people to take a particular view

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<sup>10</sup> The experimental vignettes have the expected effects on immediate outcomes: Beliefs about the seriousness of the crisis (see Appendix Table E.3).

of their government or the policies it has adopted. Instead, we leverage exogenous variation in the explanatory variables of interest that is induced by the treatments, using an instrumental variable strategy.

The use of instrumental variables derived from an experiment enables us to relax assumptions about selection on observables (Imbens and Angrist 1994; Angrist and Pischke 2008, 161-166). Using the experimental vignettes as instruments for endogenous causal factors of interest, we can estimate causal linkages for the subpopulation of people who respond to the experimental treatments. We can interpret the results causally under four assumptions.

First, we need to assume that the instrument is as good as randomly assigned. In our case, this assumption holds thanks to the experimental design.<sup>11</sup>

Second, the instrument should be relevant for the endogenous explanatory variables of interest. While the experimental vignettes may have no effect on some respondents, they must have an effect on some. We show below that this is indeed the case and there is a substantively and statistically relevant first stage.

The third assumption is the exclusion restriction, which requires that the experimental vignettes only affect the outcome through the particular variable of interest. Again, randomization of the vignettes helps in that it blocks some potential mechanisms. We discuss possible violations of the exclusion restriction at each step of the analysis. Our design also enables us to relax this assumption by instrumenting for some additional channels.

The final assumption is monotonicity. It requires that all people who respond to the information respond to it in the same way. For instance, people exposed to positive information should be weakly more satisfied with the head of government than they would be if they were exposed to negative information. This part of the assumption is not directly testable, but we use different ways to construct the instruments and

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<sup>11</sup> We verify that observables (gender, age, occupation, religion, health status, race, income and education) are balanced across experimental conditions (see Appendix Table E.2).

varying modeling strategies as a robustness check.

## Weights given to health and the economy in the overall evaluation of the government

Our theoretical framework implies that both health and economic measures matter when people form an overall evaluation of the head of government (H1). We test this hypothesis by regressing overall satisfaction with the head of the government ( $S_i^G$ ) on satisfaction with the health and economic responses, using specifications of the following form:

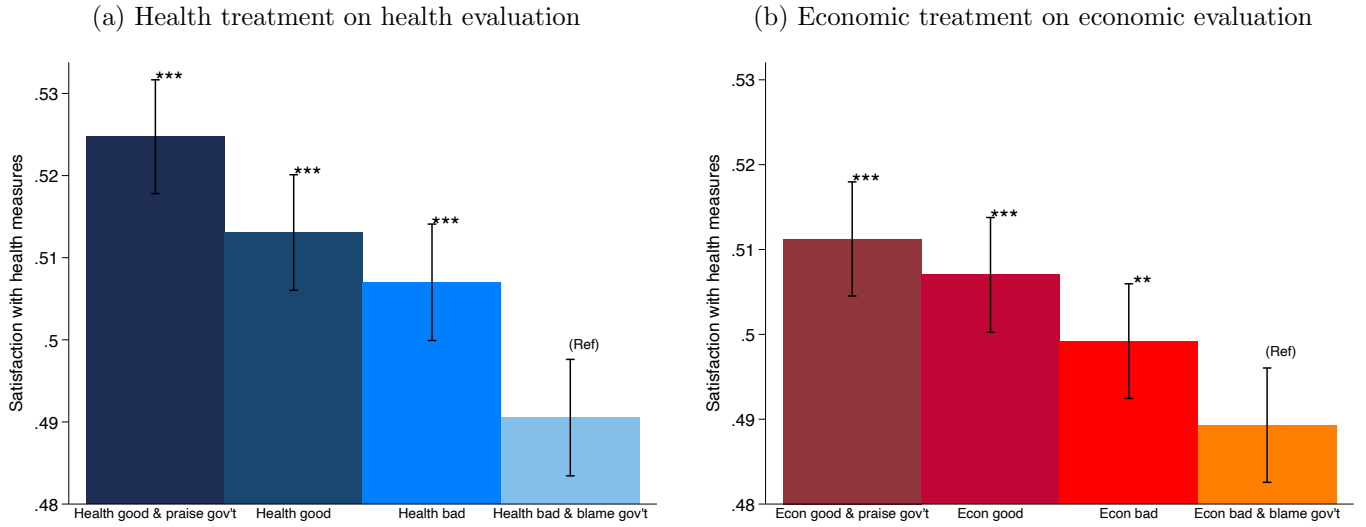
$$S_i^G = \alpha_0 + \alpha_1 S_i^H + \alpha_2 S_i^E + v_i. \quad (1)$$

Given the concern that the error term  $v_i$  includes omitted variables, we instrument  $S_i^H$  (resp.  $S_i^E$ ), the respondent’s level of satisfaction with the health (resp. economic) measures, which are endogenous, with the experimental treatment groups.

**Identification** The exclusion restriction requires that the instruments from the experiment only affect respondents’ level of satisfaction with the head of the government through their effects on satisfaction with the health and economic responses. While this assumption is not directly verifiable, the fact that the texts of the vignettes focus on the health and economic dimensions of the crisis and that they only praise or criticize the government for policies implemented on these two dimensions makes it plausible.

Figure 1 indicates that randomized messages have a sizeable effect on people’s evaluation of health and economic policies in the first stage. Panel (a) displays average satisfaction with the health measures enacted to mitigate the pandemic for each of the four different health messages. For respondents receiving messages highlighting comparatively negative information about the country’s health situation and attributing some blame to the government, average satisfaction is 0.491 on the (rescaled) outcome ranging from 0 to 1. In comparison, average satisfaction is about 0.034 units higher among respondents receiving a positive health message including some praise

Figure 1: Effect of randomized messages on satisfaction with policy response



Notes: Stars indicate the significance of the difference between each group and the reference group. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . First-stage regressions include interactions between health and economic messages (16 instruments), see Appendix Table E.5.

for the government. The difference is statistically significant at conventional levels ( $p = 0.001$ ), and it corresponds to a 6.9% increase relative to the mean in the former group. Satisfaction with the health policy response increases as messages become more positive, and all differences with the most negative reference category are statistically significant.

The picture for people’s satisfaction with economic policies enacted to cope with the crisis, shown in panel (b) of Figure 1, is analogous. Satisfaction with the economic policy response increases monotonously from the worst message to the best, and all differences with the reference category are statistically significant. The difference in means between comparatively negative information attributing some blame to the government and comparatively positive information attributing some praise is 0.022, corresponding to a 4.5% increase.

The experimental design fully crossed health and economic messages. For parsimony, Figure 1 focuses on the effects of messages on one dimension on the evaluation of the policy response on that dimension, averaging over the messages on the second

dimension. Not surprisingly, the contrast between the bottom and top treatments is even larger when considering interactions between dimensions. Compared to respondents receiving negative information and attributing some blame to the government on both dimensions, satisfaction with health measures is 0.062 units higher (12.9%) among respondents receiving positive information and praise to the government about the country’s health and economic situation ( $p = 0.001$ ), and satisfaction with economic measures is 0.044 units higher (9.2%,  $p = 0.001$ ). Appendix Table E.5 displays all the coefficients.

While two instruments would suffice to separate the effect of health and economic evaluations on downstream outcomes, our experimental design enables us to run a fully saturated first-stage specification including one dummy for each of the 16 treatment groups (one of which is omitted as the reference category).<sup>12</sup> This specification has the advantage of avoiding functional form assumptions and it enables us to relax the exclusion restriction later on. But having many instruments also increases the risk of weak instruments issues (Angrist and Pischke, 2008, ch. 4). By design, the difference in information received by some experimental groups is small.

Therefore, we follow the advice of Angrist and Pischke (2008, 209) and also employ alternative specifications that instrument the two independent variables (satisfaction with the health and economic responses) with two summary instrumental variables (labelled Health IV and Econ IV). They provide a univariate score summarizing the intensity of the four health and economic treatments, respectively. Each ranges from 0, which corresponds to a negative message that assigns blame to the government on the corresponding dimension, to 1, which corresponds to a positive message that praises the government; other treatments receive intermediary values. When analyzing effects on democratic support, we go one step further and use a unique instrument summarizing both the economic and health treatments (SumIV). The exact mapping between the treatment groups and the values given to these summary variables is

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<sup>12</sup> For the first-stage regression estimates, see Appendix Table E.5.

shown in Appendix Tables D.1 and D.2. As shown in Table 2, while the Cragg-Donald statistic associated with the fully saturated first stage is lower than the rule of thumb threshold of 10 for the  $F$ -statistic (Stock, Yogo et al., 2005), it is above that threshold in the just-identified models.

Table 2: Impact on overall satisfaction with the head of government

	Satisfaction with the head of government			
	(1)	(2)	(3)	(4)
Economic satisfaction	0.387** (0.151)	0.394*** (0.145)	0.304* (0.178)	0.311* (0.171)
Health satisfaction	0.378*** (0.111)	0.377*** (0.106)	0.390*** (0.128)	0.383*** (0.121)
Individual controls		X		X
Country FE		X		X
Observations	22,541	22,541	22,541	22,541
Outcome mean	0.458	0.458	0.458	0.458
Linear combination of estimates:				
Difference Economic satisfaction	0.009	0.017	-0.086	-0.072
-Health satisfaction	(0.232)	(0.223)	(0.262)	(0.253)
Instruments	16 IVs	16 IVs	2 SumIVs	2 SumIVs
Cragg-Donald statistic	2.550	2.889	12.221	14.088

*Notes:* The table reports instrumental variable (2SLS) estimates. The dependent variable ranges from 0 to 1 and measures the level of satisfaction with the head of government (President/Prime minister/Chancellor). Satisfaction with health and the economy are instrumented with the sixteen treatment groups (cols. 1 and 2) or with the two summary instruments (cols. 3 and 4). See Appendix D for summary instrument details. Columns 2 and 4 control for country fixed effects and the following individual controls: age (decade of birth dummies), income (quartile dummies), gender, education (dummies for high-school diploma and college degree), religious denomination dummies, job status (part-time, full-time, unemployed, self-employed, out of labor force), health status, race (White, Black, Latino, Asian), and occupation (white-collar, blue-collar, and service worker dummies).

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Results** We now estimate the impact of satisfaction with health and economic responses on people’s satisfaction with the government leader. Table 2 displays results from the instrumental variable analysis estimated using two-stage least squares.<sup>13</sup> Reassuringly, the results are very similar whether the satisfaction with the health and

<sup>13</sup> Here and in all analyses below, we use heteroscedasticity-consistent standard errors. They are not clustered because randomization was conducted at the individual level.



economic responses are instrumented with the sixteen treatment dummies (columns 1 and 2) or with the two summary instruments (columns 3 and 4), and with controls (columns 2 and 4) or without (columns 1 and 3). While individual-level covariates and country fixed effects are not needed to ensure the exogeneity of the design-based instruments, they may increase precision.

In our preferred specification, shown in column 4, a one point increase in satisfaction with the health or economic response increases overall satisfaction with the head of the government by 0.31 and 0.38 points, respectively. The point estimates on health and economic satisfaction are significant at 5% in six out of eight cases (and at the less demanding 10% level in the remaining two cases). They are never significantly different from each other. Thus, on average, respondents place approximately equal weight on the health and economic dimensions when they assess the action of the government. The result is in line with theoretical expectations, and it bolsters the case that people pay attention to both dimensions.

## Government performance and democracy

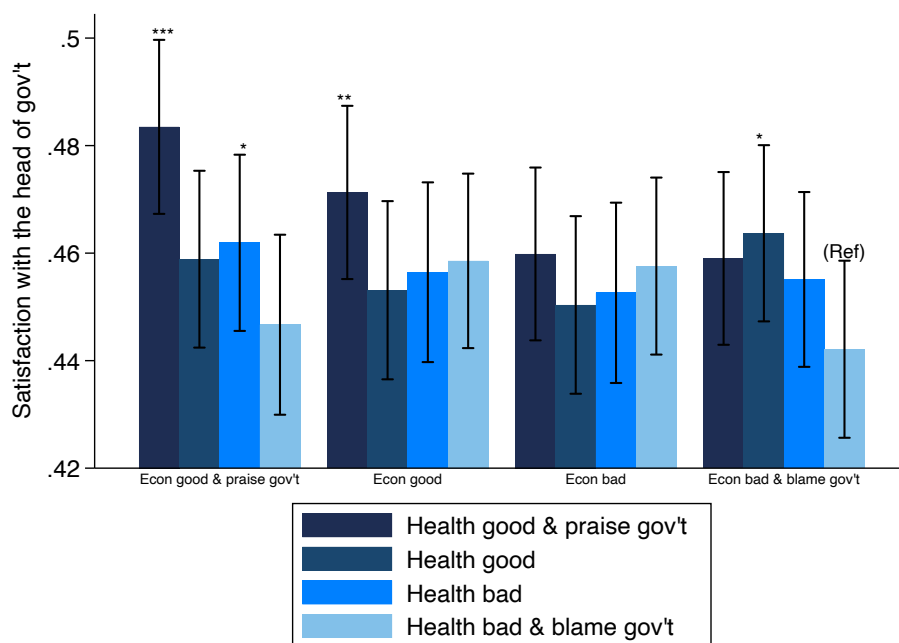
Now we turn to the hypothesis that dissatisfaction with the head of the government during the pandemic should lead to dissatisfaction with democracy (H2). Formally, we estimate specifications of the form in Equation (2):

$$Y_i = \xi_0 + \xi_1 S_i^G + \eta_i, \quad (2)$$

where  $Y_i$  is an attitude on democracy and  $S_i^G$  (the satisfaction with the head of government) is instrumented with our sixteen treatment dummies, with the two scalar instruments summarizing the health and economic treatments (Health IV and Econ IV), or with the single scalar instrument summarizing all treatments (SumIV).

Once again, the instruments are exogenous by design and, as shown in Figure 2 and Appendix Table E.6, we have a relevant first stage. The sixteen treatment dummies, the two summary instruments, and the single instrument all have significant effects on

Figure 2: Effect of randomized messages on satisfaction with head of government



Notes: Stars indicate the significance of the difference between each group and the reference group. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . For first-stage regressions, see Appendix Table E.6.

satisfaction with the head of government. Figure 2 plots the average satisfaction with the head of government, rescaled to range from 0 to 1, for all treatment groups. It shows that compared to respondents randomly receiving the most negative information, average satisfaction is 0.04 units higher among respondents who received the most positive information about the country's situation and the government. Again, the difference is statistically significant and politically meaningful, representing a 9.4% increase. Contrasting health messages also show a statistically significant effect on satisfaction with the government when the economic message is held fixed. Similarly, contrasting economic messages matter when the health message is held fixed. To address the concern of weak instruments, the just-identified specification with a single summary instrument is our preferred one. As expected, the  $F$ -statistic associated with the first stage of the univariate summary instrument is larger (equal to 10.2 with controls and 8.6 without) than when using multiple instruments.

The exclusion restriction requires that our treatments did not affect respondents'

attitudes on democracy through any other channel than by affecting their satisfaction with the head of government. This restriction would be violated, for instance, if the vignettes emphasizing the gravity of the crisis made respondents more negative overall and tainted their responses to all subsequent questions, including those recording their satisfaction with and support for democracy. We bring support for the assumption underlying the exclusion restriction with two pieces of evidence, shown in Appendix Sections E.9 and E.10. First, we show that the impact of satisfaction with government is very similar when we control (and instrument) for other possible mediating factors in Equation (2): beliefs about the seriousness of the health and economic situation. Second, our effects are nearly identical when we only use the experimental variation stemming from vignettes mentioning the government’s response to the crisis. The assumption underlying the exclusion restriction is weaker in that case. Indeed, it is not straightforward to see how this specific source of variation could have affected attitudes on democracy through another channel than their satisfaction with the government.

Table 3: Impact on satisfaction with democracy

	Satisfaction with democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Satisfaction with the head of government	0.522*** (0.149)	0.528*** (0.143)	0.476** (0.220)	0.496** (0.208)	0.450** (0.228)	0.460** (0.215)
Individual controls		X		X		X
Country FE		X		X		X
Observations	22,541	22,541	22,541	22,541	22,541	22,541
Outcome mean	0.500	0.500	0.500	0.500	0.500	0.500
Instruments	16 IVs	16 IVs	2 SumIVs	2 SumIVs	SumIV	SumIV
F-statistic	1.328	1.578	4.573	5.449	8.595	10.208

*Notes:* The table reports instrumental variable (2SLS) estimates. The dependent variable is the respondent’s level of satisfaction with the way in which democracy works in their country, which ranges from 0 to 1. Satisfaction with the head of government is instrumented with the sixteen experimental groups (columns 1 and 2), with the two summary instruments (columns 3 and 4), or with the single summary instrument (columns 5 and 6). See Appendix D for summary instrument details. Controls as in Table 2.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Turning to the second-stage results shown in Table 3, we see that satisfaction with the head of the government has a large impact on respondents’ satisfaction with how democracy works in their country. As we leverage experimental variation in the former,

we can rule out that this relationship merely reflects reverse causality or unobserved confounders. In our preferred specification (column 6), a one point increase in satisfaction with the head of government increases satisfaction with democracy by 0.46 points. The effect is significant at the 5% level and of similar size across specifications. While smaller than the OLS estimate (Appendix Table E.7), the IV estimate implies a fairly large pass-through from evaluations of the incumbent government to the functioning of democracy. Supporting H2, there is evidence of a causal link between people’s view of their government and their satisfaction with how democracy works in their country more broadly. That is, blame or praise does not stop with the incumbent government.

While our goal is not to estimate the compound effect of the pandemic on public attitudes, one may nonetheless ask what our findings imply about the drop in satisfaction with democracy observed in several countries after an initial rally effect (Bol et al., 2021; Kritzinger et al., 2021; Schraff, 2021). A back-of-the-envelope calculation based on the estimates in Table 3 suggests that out of the 4.0 percentage points decrease in satisfaction with democracy observed between April and July 2020 (Appendix Figure F.1), approximately 2.4 percentage points (60%) may be attributed to the (steeper) decline in the satisfaction with the head of government.

In contrast with the results found on satisfaction with the way democracy works, Table 4 shows that respondents’ support for democratic ideals and their attitudes on other regime types are not significantly affected by their satisfaction with the head of government. Only one coefficient in the table is statistically significant, but this result is not robust to the choice of first stage variables. The coefficients in this table are generally noisy, and should be interpreted with caution, but they stand in stark contrast with OLS estimates, which are statistically significant (see Appendix Table E.7).

Taken together, the experiment shows the existence of a strong causal relationship between people’s satisfaction with the leader of the incumbent government and the functioning of democracy. However, there is no robust evidence that this linkage extends to the absolute desirability of having a democratic system. In that respect, the

Table 4: Impact on support for democratic ideals

	Strong leader		Experts		Army		Democracy	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Satisfaction with the head of government	-0.165 (0.320)	-0.052 (0.480)	0.046 (0.341)	-0.009 (0.514)	-0.601** (0.295)	-0.657 (0.463)	0.102 (0.208)	0.056 (0.311)
Individual controls	X	X	X	X	X	X	X	X
Country FE	X	X	X	X	X	X	X	X
Observations	22,535	22,535	22,537	22,537	22,536	22,536	22,537	22,537
Outcome mean	0.316	0.316	0.590	0.590	0.181	0.181	0.902	0.902
Instruments	16 IVs	SumIV	16 IVs	SumIV	16 IVs	SumIV	16 IVs	SumIV
F-statistic	1.567	10.114	1.567	10.092	1.566	10.016	1.580	10.111

*Notes:* The table reports instrumental variable (2SLS) estimates. The dependent variables are: indicator variables equal to 1 if the respondent thinks that having a strong leader (columns 1 and 2), experts (columns 3 and 4), the army (columns 5 and 6) ruling, or a democracy (columns 7 and 8) is a good political system. Satisfaction with the head of government is instrumented with the sixteen treatment dummies (columns 1, 3, 5, and 7) or with the single summary instrument (columns 2, 4, 6, and 8). Individual controls as in Table 2.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

evidence for performance-based theories remains mixed.

## Further analysis

Additional analyses reported in the Appendix further probe the robustness of these results and explore impact heterogeneity and mechanisms.

**Cross-national heterogeneity** The results are robust to dropping the two youngest democracies, Brazil and Poland (Appendix Tables E.9 and E.10). We also explore heterogeneity based on the magnitude of the health and economic situation faced by each country. The link between satisfaction with the government and satisfaction with democracy is slightly stronger in countries with lower mortality and comparatively better economic outlook, perhaps because attitudes remained more malleable in these countries, but the differences with other countries are not statistically significant (Appendix Table E.12). We note that the effect of government satisfaction on satisfaction with democracy is significant in all four groups: countries with below vs. above median mortality, and those with below vs. above median economic outlook.

**Individual heterogeneity** Instrumental variable analysis recovers effects for the population of compliers, i.e., individuals affected by the instruments (here, our experimental treatments). While this method uncovers truly causal estimates, it naturally raises questions about the characteristics of compliers and the generalizability of the results. Such concerns are shared with all experimental and instrumental variable designs. For instance, quarter-of-birth, newspaper subscriptions, or encouraging messages have statistically significant effects on endogenous treatments like education, turnout, and the use of voting advice applications, but do not explain most of their variation (Angrist and Pischke 2008, 169; Gerber, Green and Shachar 2003; Pianzola et al. 2019).

While the population that responds to the instrument is easy to characterize in the case of a binary instrument and a binary endogenous treatment (Angrist and Pischke, 2008, ch. 4), doing the same is difficult in our more complicated setting with 16 treatment groups (Imbens and Rubin, 1997, 562). In Appendix Figure E.1, we first explore individual-level heterogeneity in the first stage based on observable characteristics. While we observe some variation based on gender, education, and religion (with women being more responsive to health messages, and respondents with college education or without religion updating less their level of satisfaction with the head of government), heterogeneity based on age, income, and partisanship is small and not statistically significant. Hence, the set of compliers does not seem to be overly dominated by specific types of individuals.<sup>14</sup>

Second, we use an alternative model that estimates average rather than local effects by modeling individual heterogeneity. The instrumental variable estimator of the correlated random coefficient model proposed by Masten and Torgovitsky (2016) allows for unobserved individual heterogeneity in response to the instrument in the first-stage and in the causal effect of interest (assuming instruments are exogenous, and restricting un-

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<sup>14</sup> Directly counting compliers would require dichotomizing both the instruments and the treatment variable, which would dramatically underestimate their number. Furthermore, such (extreme) coarsening of the instruments is likely to generate bias (Marshall, 2016).

observed heterogeneity to one dimension). Reassuringly, the estimates are comparable to the ones reported above (Appendix Table E.13).

**Mechanisms** We now turn to a brief examination of mechanisms. We first consider peoples' perceived efficacy in the political process. While the effect of satisfaction with the head of government on three measures of efficacy is consistently positive, it is generally not statistically significant (Appendix Table E.8). This suggests that perceptions of political efficacy are not the main channel explaining the effect of satisfaction with the government on satisfaction with democracy.

Second, additional analyses suggest that the impact of government evaluation on satisfaction with democracy is unlikely to be explained by people blindly punishing democracy for bad outcomes that are beyond the control of policymakers. When we only use the treatments praising or blaming the government for its response to the crisis as instruments, we find that the effect of satisfaction with the head of government on satisfaction with democracy is substantively the same as in our main analysis (Appendix Tables E.14 and E.15).

Finally, we find that our treatments concerning the health situation also shape people's evaluation of their regional government (Appendix Table E.18). While not part of our pre-registered analysis, this result illustrates the relevance of subnational executive actors in the crisis. An instrumental variable analysis shows that evaluations of the regional governments also shape satisfaction with democracy, though this effect becomes insignificant once we account for the chief executive (Appendix Table E.19).

## Conclusion

We have provided evidence of causal linkages between people's evaluation of policies, leaders, and democracy during the Covid-19 pandemic. Our analysis leverages a survey experiment conducted in 12 countries. A total of 22,500 respondents received randomly selected vignettes about the gravity of the crisis and assessments of the gov-

ernment's response. Prior to the experiment, our respondents had been exposed to abundant, and often contradictory information about the crisis: few events have dominated media coverage and the public debate as much as the Covid-19 pandemic. In this context, rather than providing new factual information, our strategy was to put the crisis in historical and cross-national perspective by comparing it to randomly varying benchmarks, and to make some facets of the crisis and of its management salient in the mind of respondents.

We find that respondents put approximately equal weight on their satisfaction with respect to health and economic dimensions when providing an overall assessment of the head of government. Dissatisfaction with the government in turn increases dissatisfaction with democracy, but it does not increase support for non-democratic alternatives.

The results do not show an across the board blaming of democracy in a global crisis. Rather, they suggest that considerations of relative performance and policy responses feed into attributing blame to specific leaders as well as the functioning of democracy. The upside is that there is no explicit turn to non-democratic alternatives in response to dissatisfaction with how political leaders handled the crisis. But the increase in dissatisfaction with democracy suggests a growing pool of dissatisfied citizens that may be tapped by political entrepreneurs who pay lip service to democracy but are willing to undermine it. While we focused on a devastating pandemic as a test case, the theoretical logic may also apply to other environments with multiple salient performance dimensions.

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# Online Appendix

## Contents

<b>A</b>	<b>A formal model of democratic attitudes</b>	<b>1</b>
<b>B</b>	<b>Survey, pre-registration, and text of the vignettes</b>	<b>2</b>
	B.1 Survey ethics . . . . .	2
	B.2 Pre-registration . . . . .	3
	B.3 Vignettes . . . . .	5
<b>C</b>	<b>Question wording for outcome variables</b>	<b>14</b>
<b>D</b>	<b>Construction of summary instruments</b>	<b>15</b>
<b>E</b>	<b>Additional results</b>	<b>16</b>
	E.1 Verifying randomization . . . . .	16
	E.2 Balance tests . . . . .	16
	E.3 Checking treatment relevance . . . . .	16
	E.3.1 Direct impact of the treatments on beliefs . . . . .	17
	E.3.2 Direct impact of the treatments on satisfaction levels . . . . .	17
	E.4 First stage tables . . . . .	19
	E.5 OLS estimates . . . . .	22
	E.6 Results on efficacy variables . . . . .	22
	E.7 Cross-national heterogeneity . . . . .	23
	E.7.1 Robustness to excluding young democracies . . . . .	23
	E.7.2 Heterogeneity based on country situation at the time of the experiment . . . . .	24
	E.8 Individual Heterogeneity . . . . .	25
	E.8.1 Heterogeneity in observables . . . . .	25
	E.8.2 Heterogeneity in unobservables . . . . .	26
	E.9 Robustness to using only blaming and praising the government as instruments . . . . .	29
	E.10 Robustness to adding intermediary endogenous variables . . . . .	30
	E.11 Analyzing satisfaction with the regional government . . . . .	32
<b>F</b>	<b>Aggregate trends</b>	<b>33</b>

## A A formal model of democratic attitudes

A stylized selection model of democratic politics formally illustrates the intuition spelled out in the second section of the paper. A key mechanism is that a second salient policy dimension can provide important information about the quality of democracy.

Formally, consider a representative citizen that observes government performance in period  $t = 1$  and thereby has an opportunity to learn about the functioning of democracy. After updating her beliefs, in period  $t = 2$  the citizen may take a political action, such as voicing support for democracy, voting, protesting, etc., which may in turn affect the selection of the new government and the rules of the game. More specifically, the observed performance of the government in period  $t$  is denoted by  $g_t$ , which can take any value between 0 and 1, with higher values representing better performance or well-being for the citizen. The set of political leaders that shape overall performance  $g_t$  varies with the state of the world, which is indicated by the indicator function  $\mathbb{1}$ . In normal times ( $\mathbb{1} = 1$ ), performance is by and large attributed to the competence of one set of leaders denoted by  $A$ . Following the large literature on accountability and economic voting, one may think of the economy as the dominant issue and the chief executive (i.e., prime minister or president) as the chief focus of public attention but it could be any other issue. In crisis times ( $\mathbb{1} = 0$ ), another issue becomes salient, for instance public health during a pandemic, so overall performance is a result of a larger set of leaders: all actors in set  $A$  as well as an additional set of actors,  $B$ . For instance, in a parliamentary government, the health minister now will also be important. Looking beyond the cabinet, an effective pandemic response requires efforts across different levels of government, and in particular state executives (i.e., premiers or governors) become salient. Hence, in this situation the policy outcome can be construed as the weighted sum of policymakers' competence, with weight  $\alpha$  for policymakers  $A$  and weight  $1 - \alpha$  for policymakers  $B$ . To summarize, first-period performance is:

$$g_1 = \mathbb{1}g_1^A + (1 - \mathbb{1})(\alpha g_1^A + (1 - \alpha)g_1^B) \quad (\text{A.1})$$

Following pure adverse selection models, assume that good policymakers tend to generate good outcomes and bad policymakers bad outcomes (Duch and Stevenson, 2008). Moreover, the competence of policymakers is persistent. The probability that a new policymaker  $j \in \{A, B\}$  is a competent type is  $Pr(g^j = 1) = \pi$ . Here, the parameter  $\pi$  captures the ability of existing democratic institutions to select or foster good politicians. The opportunity to learn about democracy arises because citizens are not certain about  $\pi$ .<sup>1</sup> The citizen has a prior belief that democracy works, captured by  $\pi \in \{l, h\}$  with  $0 < l < h < 1$ . The prior probability that democracy is good at producing capable, public spirited leaders is  $Pr(\pi = h) = q$ , and the prior probability that democracy does not work so well in this sense is  $Pr(\pi = l) = 1 - q$ . The parameters  $l, h, q$  have been shaped by history and culture.

What can a rational citizen infer about the quality of democracy  $\pi$  after observing first-period performance? The answer varies with the salient number of dimensions. Suppose that times are normal ( $\mathbb{1} = 1$ ), so that there is a single salient dimension, and observed first-period performance is bad ( $g_1 = 0$ ). Bayes' rule gives the citizen's updated probability that democracy works well:

$$Pr(\pi = h | g_1 = 0, \mathbb{1} = 1) = \frac{q(1 - h)}{q(1 - h) + (1 - q)(1 - l)} \quad (\text{A.2})$$

Suppose there is a pandemic ( $\mathbb{1} = 0$ ), so that there are two salient dimensions, and observed first-period performance is bad ( $g_1 = 0$ ). Now, the citizen's updated probability that democracy works well is

$$Pr(\pi = h | g_1 = 0, \mathbb{1} = 0) = \frac{q(1 - h)^2}{q(1 - h)^2 + (1 - q)(1 - l)^2} \quad (\text{A.3})$$

---

<sup>1</sup>Here, we build on Meiorowitz and Tucker (2013). While their model emphasizes the difference between old and new democracies and suggests that in old democracies people's beliefs are quite stable, we adapted their framework to analyze learning with more than one dimension.



It is apparent that the citizen’s posterior belief that democracy works well is lower in the pandemic than in normal times:  $Pr(\pi = h|g_1 = 0, \mathbb{1} = 1) > Pr(\pi = h|g_1 = 0, \mathbb{1} = 0)$ . The reason is that bad performance is more informative about democracy in the pandemic because it involves a larger set of salient policy leaders. By the same logic, after observing good performance, updating is more positive in the pandemic than in normal times.  $Pr(\pi = h|g_1 = 1, \mathbb{1} = 0) > Pr(\pi = h|g_1 = 1, \mathbb{1} = 1)$ .

The analysis can be generalized by considering  $K \geq 2$  possible sets of policymakers that are involved in making salient decisions in times of crisis. After observing bad performance in a pandemic, the posterior belief that democracy is good is

$$Pr(\pi = h|g_1 = 0, \mathbb{1} = 0) = \frac{q(1-h)^K}{q(1-h)^K + (1-q)(1-l)^K} \tag{A.4}$$

Taken together, this model illustrates that a pandemic can be a good time for people to learn how well democracy works. The reason we highlight is the multi-dimensional aspect of the crisis. Notably, the mechanism is not based on people blindly punishing democracy for bad performance. Rather, the mechanism is the flip side of accountability models such as [Duch and Stevenson \(2008\)](#). Accountability models correctly highlight that having a larger number of policymakers makes it more difficult for citizens to learn from overall performance about the competence of any particular incumbent. However, our analysis shows that having a larger set of policymakers also provides a more informative signal about the effectiveness of the democratic political system as a whole.

Note that the model can also be interpreted in terms of learning more about the chief executive. Assume for the sake of clarity that the chief executive is the only publicly salient policymaker. If the competence of managing the economy in normal times is not perfectly correlated with managing a crisis, then the pandemic also enhances learning about democracy through this complementary channel. Assuming that the leader’s competence on both dimensions are i.i.d draws, the formal model leads to the same Bayesian updating as above ([A.2-A.3](#)).

## B Survey, pre-registration, and text of the vignettes

### B.1 Survey ethics

This study adheres to the APSA Principles and Guidance for Human Subjects Research. The data collection is based on an online opt-in survey in 12 countries of adults that gave informed consent to participate in the survey. The study did not include vulnerable groups or entailed any physical or otherwise harmful interventions. No deception was used.

The online, opt-in surveys on the adult population were conducted by commercial companies. Respondents are adults who have given their prior consent to be contacted to participate in a survey. Invitations to participate in our survey were emailed to the company’s pool of respondents so that the sample of respondents matches relevant quotas on the population margins with respect to variables like age, occupation, and region of residence (quota sampling). People that chose to opt-in to participate in the survey (on their computer or mobile phone) then had to give their explicit consent. First, at the beginning of the survey, respondents must agree by reading the documents regarding data confidentiality and privacy policy and take an active action to give their consent (tick a special box stating “Yes, I agree”). Second, the survey informs them about the type of questions they will encounter in the survey and asks them for their informed consent.

The survey covers questions about politics and political preferences, which may be seen as sensitive. However, the risk here was minimal as all countries are established democracies and places where opt-in surveys of this nature are low risk and standard. For instance, this survey is of the same nature as national elections surveys (e.g., American National Election Study) or comparative survey projects like the International Social Survey Program (ISSP), the European Social Survey (ESS), or the Latinobarómetro. The research does not involve vulnerable groups. It only includes participants that can give informed consent. It does not involve physical interventions on the participants and does not entail risk of harm. No drugs,

placebos, or other substances are administered. No invasive, intrusive, or potentially harmful procedures of any kind are involved. The research does not involve administrative or secure data that requires permission from the appropriate authorities before use. As discussed in the main text, the survey does not use deception. The survey experimental treatments consist in the exact randomization of survey questions without regard to subjects’ characteristics. The analysis dataset does not contain the name, contact, or geo-location of participants.

Respondents received a modest reward for participating in the short survey (about 15 minutes). Specifically, respondents received points based on the level of effort (meaning the number of questions seen by a respondent and time spent on the link). The points could then be used to “buy” vouchers or donate them to a charity cause. For this survey, the average number of points awarded to each respondent was 60, which corresponds to 60 euro cents.

## B.2 Pre-registration

The study was preregistered with the University of Pennsylvania-Wharton School’s Credibility Lab before data was collected. The pre-analysis plan (PAP) is reprinted at the end of this section (including a link to the anonymized copy of the PAP hosted at the Lab). Below we summarize the mapping between the planned analysis in the pre-registration and results presented in the paper for each outcome variable. We also note deviations from the plan.

As stated in the PAP, the analysis of the experimental data looks at a causal chain from proximate to more distant outcome variables, with five different types of outcome variables. Given space constraints, the presentation of the results in the main text focuses on the main instrumental variable analysis focusing on the more distal outcomes related to the evaluation of government leaders and democracy:

- Impact of health and the economy on satisfaction with the head of the incumbent government (outcome iii in PAP): Table 2.
- The impact of satisfaction with head of government on satisfaction with democracy and democratic regimes (outcomes v in PAP): Tables 3 and 4.
- The impact of satisfaction with head of government on internal and external efficacy (outcomes iv in PAP) is discussed in the main text. Due to space constraints, detailed results are reported in Online Appendix Table E.8.
- As stated in PAP, we report 2SLS estimates without and with controls. The PAP states that the instrumental variable analysis uses the experimental treatments as instruments. Our baseline specifications use all available treatment indicators as instruments. In addition and in order to address concerns about weak instruments, we report results using summary instruments (see appendix D for their construction) reducing the experimental variation to one or two dimensions.

The results regarding the impact of the treatments on more proximate outcomes based on an intention-to-treat analysis are illustrated in Figures 1 and 2 in the main text. Regression results are in Online Appendix:

- The effect of treatments on respondents’ perception of the gravity of the crisis, in terms of health and the economy (outcome i in PAP): Detailed results are shown in Table E.3.
- The effect of treatments on respondents’ level of satisfaction with the health and economic measures taken by the government to address the crisis (outcome ii in PAP): Detailed results are shown in Table E.6.

**Deviations from the PAP.** First, the survey was not fielded in Canada. Second, in France the sample size is larger than the target sample. As discussed in the main text, treatments were initially not cross-randomized as instructed and in France the survey company ran the correct experiment among a larger sample of respondents, none of whom had participated in the faulty survey. Third, the PAP includes post-treatment questions on anger, fear, and hope (outcomes vi in PAP). However, these variables had to be cut from the survey in most countries to maintain within the budgeted length.

**CONFIDENTIAL - FOR PEER-REVIEW ONLY****Survey experiments on political consequences of the COVID-19 pandemic (#43111)**

Created: 06/17/2020 03:12 PM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer-review.  
A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

**1) Have any data been collected for this study already?**

No, no data have been collected for this study yet.

**2) What's the main question being asked or hypothesis being tested in this study?**

The experiment is designed to examine political consequences of the COVID-19 pandemic. In particular, this study aims to assess how people's evaluation of the health situation and the economic situation shape satisfaction with the actions of the incumbent government as well as general beliefs about the functioning of democratic politics and democratic institutions. Moreover, does the relative importance of health vs. economic considerations vary across salient cleavages (age, gender, personal economic situation)?

**3) Describe the key dependent variable(s) specifying how they will be measured.**

Causal chain from proximate to more distant outcome variables:

- (i) Assessment of consequences of COVID-19 epidemic for health and economy in the country, each on 5-point scale.
- (ii) Satisfaction with the health and economic measures taken by the government to cope with the COVID-19 pandemic, each on a separate 11-point scale.
- (iii) Satisfaction with head of incumbent government (11-point scale).
- (iv) Efficacy. Measured with two standard items on whether politicians care about what people like me think and politics being too complicated, each on 5-point scale.
- (v) Satisfaction with working of democracy (11-point scale) and evaluation of democratic and three other political systems (each on 4-point scale).
- (vi) Manipulation check: Post-treatment questions on anger, fear, hope.

**4) How many and which conditions will participants be assigned to?**

Between-subject design. Independent randomization of 4 health information treatments and 4 economic information treatment treatments:

TH1. Positive health information.

TH2. Positive health information + government responsibility

TH3. Negative health information

TH4. Negative health information + government responsibility

In countries with sample size of N=2,000+ there is a group that receives no treatment.

The logic for economic information treatments is the same.

**5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.**

Intention-to-treat analysis of treatments on outcomes (i) to (v) using linear regression.

Treatment-on-the-treated analysis: Instrumental variable analysis of effect of satisfaction with health and economic measures on outcomes (iii) to (v), where experimental treatments are used to instrument endogenous treatment variables (ii). Basic model is 2SLS without controls. Robustness check includes socio-demographic covariates.

Heterogeneity: interaction of treatments with socio-demographic characteristics including age, gender, and household income.

**6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.**

No cases will be classified or excluded as "outliers". France, Germany, US: exclude those not receiving any information from main analysis.

**7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.**

The experiment is embedded in a comparative online survey and the commercial polling company attempts to balance the panel sample to be representative of each country's population of eligible voters. Target sample sizes:

N=2,000: France, Germany, Spain, US.

N=1,000: Australia, Austria, Brazil, Canada, Italy, New Zealand, Poland, Sweden, UK.

Target sample size differences are due to resource constraints unrelated to the experiment.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

Nothing else to pre-register.

## B.3 Vignettes

The survey is administered in each country's language. Below, we provide English versions of the experimental vignettes for each country.

### Australia

- Health treatments:
  - **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per hundred thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed one hundred times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
  - **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per hundred thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed one hundred times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government's response to the current health crisis had been swifter and more forceful than in other countries in the region.
  - **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 100. Many more people were infected and had to be hospitalized for days or weeks. In addition, some experts fear that a second wave of the pandemic may kill many more people.
  - **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 100. Many more people were infected and had to be hospitalized for days or weeks. In addition, some experts fear that a second wave of the pandemic may kill many more people. Many observers blamed the government for failing to prepare adequately for this risk and for taking too long to provide enough tests, masks and other health supplies for the population.
- Economic treatments:
  - **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Australia, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
  - **TE2:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Australia, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted. Voices across the political aisle praised the government for its response to the economic crisis, including the stimulus package it adopted to support households and companies across the country.
  - **TE3:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 7% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer.
  - **TE4:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 7% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer. Many voices, including within the party of the Prime Minister himself, deemed the response of the government to the economic crisis insufficient and targeted to firms and individuals that needed it the least.

### Austria

- Health treatments:
  - **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per ten thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed thirty times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.

- **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per ten thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed thirty times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government’s response to the current health crisis had been swifter and more forceful than in other countries in the region.
  - **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 700. Many more people were infected and had to be hospitalized for days or weeks. In addition, some experts fear that a second wave of the pandemic may kill many more people.
  - **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 700. Many more people were infected and had to be hospitalized for days or weeks. In addition, some experts fear that a second wave of the pandemic may kill many more people. Many observers blamed the government for failing to prepare adequately for this risk and for taking too long to provide enough tests, masks and other health supplies for the population.
- Economic treatments:
    - **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Austria, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
    - **TE2:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Austria, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted. Voices across the political aisle praised the government for its response to the economic crisis, including the stimulus package it adopted to support households and companies across the country.
    - **TE3:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 7% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer.
    - **TE4:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 7% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer. Many voices, including within the party of the Chancellor himself, deemed the response of the government to the economic crisis insufficient and targeted to firms and individuals that needed it the least.

## Brazil

- Health treatments:
  - **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per three thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed three times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
  - **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per three thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed three times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government’s response to the current health crisis had been swifter and more forceful than in other countries in the region.
  - **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 58,000 which is fifty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
  - **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 58,000 which is

fifty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the federal government for taking too long to provide enough tests, masks and other health supplies for the population. They also pointed out that the government's response to the health crisis had been slower and less successful than in other countries in the region.

- Economic treatments:

- **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Brazil, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
- **TE2:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Brazil, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted. Voices across the political aisle praised the government for its response to the economic crisis, including the stimulus package it adopted to support households and companies across the country.
- **TE3:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 6% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer.
- **TE4:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 6% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer. Many voices, including within the party of the President himself, deemed the response of the government to the economic crisis insufficient and targeted to firms and individuals that needed it the least.

## France

- Health treatments:

- **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed six times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
- **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed six times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government's response to the current health crisis had been swifter and more forceful than in other countries in the region.
- **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 29,000 which is twenty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
- **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 29,000 which is twenty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough tests, masks and other health supplies for the population. They also pointed out that the government's response to the health crisis had been slower and less successful than in other countries in the region.

- Economic treatments:

- **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than France, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.

- **TE2:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than France, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted. Voices across the political aisle praised the government for its response to the economic crisis, including the stimulus package it adopted to support households and companies across the country.
- **TE3:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 8% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer.
- **TE4:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 8% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer. Many voices, including within the party of the President himself, deemed the response of the government to the economic crisis insufficient and targeted to firms and individuals that needed it the least.

## Germany

- Health treatments:

- **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was about one per ten thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed 40 times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
- **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was about one per ten thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed 40 times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government's response to the current health crisis had been swifter and more measured than in other countries in the region.
- **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 8,500, which is several thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
- **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 8,500, which is several thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough masks and other health supplies for the population. They also pointed out that the government's response to the health crisis had been slower and less successful than in other countries in the region.

- Economic treatments:

- **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Germany, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
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## Italy

- Health treatments:

- **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed ten times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
- **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed ten times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government’s response to the current health crisis had been swifter and more forceful than in other countries in the region.
- **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 33,000 which is twenty-five thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
- **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 33,000 which is twenty-five thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough masks and other health supplies for the population. They also pointed out that the government’s response to the health crisis had been slower and less successful than in other countries in the region.

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## New Zealand

- Health treatments:



- **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per hundred thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed two hundred times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
  - **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per hundred thousand. Some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed two hundred times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government's response to the current health crisis had been swifter and more forceful than in other countries in the region.
  - **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 20. Many more people were infected and had to be hospitalized for days or weeks. In addition, some experts fear that a second wave of the pandemic may kill many more people.
  - **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 20. Many more people were infected and had to be hospitalized for days or weeks. In addition, some experts fear that a second wave of the pandemic may kill many more people. Many observers blamed the government for failing to prepare adequately for this risk and for taking too long to provide enough tests, masks and other health supplies for the population.
- Economic treatments:
    - **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than New Zealand, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
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## Poland

- Health treatments:
  - **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per ten thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed two hundred times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
  - **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per ten thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed two hundred times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government's response to the current health crisis had been swifter and more forceful than in other countries in the region.

- **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 1,000 which is nine hundred more than the number of deaths from the flu in a normal year. Many more people were infected and had to be hospitalized for days or weeks. In addition, some experts fear that a second wave of the pandemic may kill many more people.
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    - **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Poland, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
    - **TE2:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Poland, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted. Voices across the political aisle praised the Polish government for its response to the economic crisis, including the stimulus package it adopted to support households and companies across the country.
    - **TE3:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 5% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer.
    - **TE4:** In addition to its health consequences, the pandemic has also had dramatic effects for the economy. Many economists warned that the consequences may be more severe than the 2008 financial crisis, and even comparable to the Great Depression of the 1930s, predicting that GDP could decline by as much as 5% in 2020, and that unemployment would rise for several months. They expected the economic crisis to continue through 2021, if not longer. Many voices, including within the party of the Prime Minister (Premier) himself, deemed the response of the government to the economic crisis insufficient and targeted to firms and individuals that needed it the least.

## Spain

- Health treatments:
  - **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed 10 times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
  - **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed 10 times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government's response to the current health crisis had been swifter and more forceful than in other countries in the region.
  - **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 27,000 which is twenty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
  - **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 27,000 which is twenty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough tests, masks and other health supplies for the population. They also pointed out that the government's response to the health crisis had been slower and less successful than in other countries in the region.
- Economic treatments:

- **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Spain, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
- **TE2:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Spain, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted. Voices across the political aisle praised the government for its response to the economic crisis, including the stimulus package it adopted to support households and companies across the country.
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## Sweden

- Health treatments:

- **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed eight times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
- **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed eight times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government's response to the current health crisis had been swifter and more measured than in other countries in the region.
- **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 5,000 which is three thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
- **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 5,000 which is three thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough tests, masks and other health supplies for the population. They also pointed out that the government's response to the health crisis had been less forceful than in other countries in the region.

- Economic treatments:

- **TE1:** In addition to its health consequences, the pandemic has also affected the economy in the short run. However, many economists expect economic activity, consumption, and the number of jobs to rapidly go back to their levels before COVID-19. They point to the example offered by Vietnam and other Asian countries which were hit by the pandemic earlier than Sweden, imposed a general lockdown, and have experienced steep growth since the lockdown was lifted.
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## United Kingdom

- Health treatments:

- **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed four times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
- **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed four times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government’s response to the current health crisis had been swifter and more measured than in other countries in the region.
- **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 40,000, which is twenty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
- **TH4:** By the end of June, the number of deaths due to COVID-19 in the country was more than 40,000, which is twenty thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough tests, masks and other health supplies for the population. They also pointed out that the government’s response to the health crisis had been slower and less successful than in other countries in the region.

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## United States

- Health treatments:

- **TH1:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per two thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed five times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten.
- **TH2:** By the end of June, the total number of deaths due to COVID-19 in the country was less than one per two thousand. While of course dramatic, some historians put these numbers in perspective and pointed out that they were much lower than for the 1918 Spanish flu, which killed five times as many people in the country. More recently, the 1968 flu also had a higher mortality rate than COVID-19 worldwide, but it had been largely forgotten. Prominent commentators praised the government for addressing COVID-19 more effectively than these previous pandemics had been managed. They also pointed out that the government’s response to the current health crisis had been swifter and more forceful than in other countries in the region.
- **TH3:** By the end of June, the number of deaths due to COVID-19 in the country was more than 120,000 which is seventy thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks.
- **TH4:**By the end of June, the number of deaths due to COVID-19 in the country was more than 120,000 which is seventy thousand more than the number of deaths from the flu in a normal year. In addition, many more people were infected and had to be hospitalized for days or weeks. In addition, many more people were infected and had to be hospitalized for days or weeks. Many observers blamed the government for taking too long to provide enough tests, masks and other health supplies for the population. They also pointed out that the government’s response to the health crisis had been slower and less successful than in other countries in the region.

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## C Question wording for outcome variables

Perceived seriousness of the crisis		Very serious	Quite serious	Somewhat serious	Not serious	Not at all serious
CSQSANT	Would you say that the consequences of the coronavirus epidemic for health in [country] are today...?	1	2	3	4	5
CSQECO	Would you say that the consequences of the coronavirus epidemic for [country]’s economy are today...?	1	2	3	4	5

		Completely dissatisfied				Neither satisfied nor dissatisfied				Completely satisfied		
<b>Satisfaction with Government Policy</b>												
EVALSANTB	Are you satisfied with the health measures taken by the government to mitigate the Covid-19 pandemic?	0	1	2	3	4	5	6	7	8	9	10
EVALECOB	Are you satisfied with the economic measures taken by the government to cope with the Covid-19 pandemic?	0	1	2	3	4	5	6	7	8	9	10
<b>Satisfaction with the head of Government</b>												
Q3	Generally speaking, are you satisfied or dissatisfied with the action of President/Prime Minister/Chancellor [name]?	0	1	2	3	4	5	6	7	8	9	10
<b>Satisfaction with Democracy</b>												
SWT	How satisfied are you with the way democracy works in your country?											

<b>Preferences for regime types</b>		Very good way	Fairly good way	Fairly bad way	Very bad way
POSYS	There are various types of political systems. What do you think about each as a way of governing this country? For each one, would you say it is a very good, fairly good, fairly bad or very bad way of governing this country?				
	1.Having a strong leader who does not have to bother with parliament and elections.	1	2	3	4
	2.Having experts, not government, make decisions according to what they think is best for the country	1	2	3	4
	3.Having the army rule.	1	2	3	4
	4.Having a democratic political system.	1	2	3	4

<b>Satisfaction with regional government</b>		Completely satisfied	Quite satisfied	Not very satisfied	Not at all satisfied
SATCORREG	Generally speaking, are you satisfied with the way that your regional government is handling coronavirus?	1	2	3	4

## D Construction of summary instruments

Table D.1 describes how we create the two summary instruments for health and economic treatments from the corresponding treatment groups. For analyses and robustness checks that employ only a single instrumental variable, Table D.2 describes how we create the single (univariate) summary instrument combining all health and economic treatments.

Table D.1: Relation of summary instrument values to experimental treatment groups

	TH2	TH1	TH3	TH4
Health IV	1	0.75	0.25	0
	TE2	TE1	TE3	TE4
Econ IV	1	0.75	0.25	0

Table D.2: Relation of single summary instrument values to experimental treatment groups

	TH2	TH1	TH3	TH4
TE2	1	0.75	0.25	0
TE1	0.75	0.5	0	-0.25
TE3	0.25	0	-0.5	-0.75
TE4	0	-0.25	-0.75	-1

## E Additional results

### E.1 Verifying randomization

Table E.1: Joint distribution of the economic and health treatments.

Value of TH	Value of TE									
	1		2		3		4		Total	
	%	%	%	%	%	%	%	%	%	%
1	25.1	25.4	25.0	25.1	24.6	25.0	24.4	24.6	24.8	100.0
2	26.3	26.0	24.7	24.3	24.8	24.7	25.4	25.1	25.3	100.0
3	24.5	24.6	25.9	25.9	25.4	25.7	23.7	23.8	24.9	100.0
4	24.1	24.1	24.3	24.2	25.2	25.4	26.4	26.4	25.0	100.0
Total	100.0	25.0	100.0	24.8	100.0	25.2	100.0	25.0	100.0	100.0

*Notes:* Starting from the upper left corner: the first column indicates the distribution of the health treatment among respondents who received the economic treatment TE1. The second column indicates the share of respondents that received the economic treatment TE1 among those who received the health treatment TH1 (first line), TH2 (second line), TH3 (third line), and TH4 (fourth line). For instance, 25.1% of those who received TE1 also received TH1, and 25.4% of those who received TH1 also received TE1.

### E.2 Balance tests

Table E.2 presents the distribution of covariates in the sample used in the paper. We show the mean and the standard deviation of each variable as well as the F-statistic from a regression of the variable on all sixteen treatment dummies, and its associated p-value. Overall, respondents in the different treatment groups in our analysis sample are well balanced. None of the F-statistics are significant at the 5% level.

### E.3 Checking treatment relevance

To facilitate the interpretation of the results, we use the following treatment variables:

- “Gravity health”: a dummy equal to 1 for the groups TH3 and TH4, which received a negative message on the gravity of the health situation (whether or not this message mentioned the government’s response);
- “Gravity economy”: a dummy equal to 1 for the groups TE3 and TE4, which received a negative message on the gravity of the economic situation (whether or not this message mentioned the government’s response);
- “Praising health policy”: a dummy equal to 1 for the group TH2, which received a message praising the government’s health response to the crisis;
- “Praising economic policy”: a dummy equal to 1 for the group TE2, which received a message praising the government’s economic response;
- “Blaming health policy”: a dummy equal to 1 for the group TH4, which received a message blaming the government’s health response;
- “Blaming economic policy”: a dummy equal to 1 for the group TE4, which received a message blaming the government’s economic response.

Table E.2: Descriptive statistics and balance tests.

	Mean	sd	F-stat	p-value
Thirties	0.179	0.383	0.711	0.776
Forties	0.198	0.399	1.185	0.274
Fifties	0.174	0.379	0.386	0.983
Sixties	0.195	0.396	0.828	0.646
Seventies	0.108	0.310	0.917	0.544
Income, 2nd quartile	0.241	0.428	1.482	0.102
Income, 3rd quartile	0.229	0.420	0.761	0.722
Income, 4th quartile	0.235	0.424	0.733	0.752
Income, no answer	0.063	0.242	1.106	0.344
Female	0.534	0.499	1.489	0.099
High school degree	0.305	0.461	0.982	0.471
College degree	0.486	0.500	1.183	0.277
No religion	0.368	0.482	1.324	0.178
Christian, not catholic	0.142	0.349	0.961	0.494
Catholic	0.373	0.484	1.252	0.224
Full-time worker	0.267	0.442	0.469	0.957
Part-time worker	0.009	0.095	0.685	0.802
Unemployed	0.026	0.159	0.685	0.802
Self-employed	0.003	0.059	0.701	0.786
Out of labor force	0.180	0.385	0.747	0.738
Good health situation	0.646	0.478	0.945	0.513
White	0.067	0.249	0.394	0.981
Black	0.010	0.098	0.943	0.514
Latinx	0.005	0.071	0.629	0.854
Asian origin	0.005	0.071	1.245	0.229
White-collar	0.057	0.231	1.170	0.287
Blue-collar	0.050	0.218	0.624	0.858
Service worker	0.095	0.294	0.716	0.771

### E.3.1 Direct impact of the treatments on beliefs

To estimate the average effect of the treatments on beliefs about the gravity of the crisis, we estimate the following OLS regression:

$$B_i^K = \beta_0 + \beta_1 GravityEcon_i + \beta_2 GravityHealth_i + \gamma X_i + u_i, \quad (\text{E.1})$$

where  $B_i^K = \{B_i^H, B_i^E\}$  is respondent  $i$ 's belief on the gravity of the health (resp. economic) crisis,  $GravityEcon$  and  $GravityHealth$  are defined above, and  $X_i$  is a vector of controls. Recall that in all analyses, we use robust standard errors. Note that we are not using all the experimental variation at this stage. Indeed, our objective is to test whether beliefs about the severity of the crisis are affected by treatments emphasizing the gravity of the health and economic crises, regardless of signals provided about the government's response.

The results are shown in Table E.3. As discussed in the text, treatments have the expected effects: making the gravity of the health and economic crisis more salient increases the fraction of people considering its health and economic consequences as very serious by 6.9 percentage points (28% of the mean) and 8.4 percentage points (23%), respectively. Both effects are significant at the 1% level, and robust to the inclusion of sociodemographic controls and country fixed effects.

### E.3.2 Direct impact of the treatments on satisfaction levels

Table E.4 displays estimated effects of the treatments on respondents' level of satisfaction with the health and economic measures taken by the government to address the crisis, which are discussed in the



Table E.3: Impact on the perceived seriousness of the health and economic consequences of the crisis.

	Very serious health consequences		Very serious economic consequences	
	(1)	(2)	(3)	(4)
Gravity health	0.070*** (0.006)	0.069*** (0.005)	0.024*** (0.006)	0.024*** (0.006)
Gravity economy	0.008 (0.006)	0.007 (0.005)	0.083*** (0.006)	0.084*** (0.006)
Individual controls		X		X
Country FE		X		X
Observations	22,540	22,540	22,538	22,538
R2	0.007	0.121	0.008	0.071
Outcome mean	0.244	0.244	0.370	0.370

*Notes:* The dependent variable for columns 1 and 2 (resp. 3 and 4) is a dummy equal to 1 if the respondent considers the health (resp. economic) consequences of the crisis as very serious, and 0 otherwise. Question: “Would you say that the consequences of the coronavirus epidemic for health (resp. the economy) in [country] are today [Very serious / Quite serious / Somewhat serious / Not serious / Not at all serious] ?” Individual controls as defined in Table 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

text. Specifically, we use specifications of the form of Equation (E.2).

$$S_i^K = \alpha_0 + \alpha_1 GravityEcon_i + \alpha_2 GravityHealth_i + \alpha_3 BlameEcon_i + \alpha_4 BlameHealth_i + \alpha_5 PraiseEcon_i + \alpha_6 PraiseHealth_i + \gamma X_i + u_i, \quad (\text{E.2})$$

where  $S_i^K = \{S_i^H, S_i^E\}$  is the respondent’s level of satisfaction with the health (resp. economic) measures, and *GravityHealth*, *GravityEcon*, *BlameHealth*, *BlameEcon*, *PraiseHealth*, and *PraiseEcon* are defined above. Table E.4 shows the results of Equation (E.2) as well as linear combinations of the estimates. Specifically, we report the difference between the effect of messages praising and blaming the government’s health (resp. economic) response to the crisis and test whether this difference is statistically significant.

Table E.4: Impact on satisfaction with the government’s response to the crisis.

	Health satisfaction		Economic satisfaction	
	(1)	(2)	(3)	(4)
Gravity health	-0.006 (0.005)	-0.005 (0.005)	0.003 (0.005)	0.004 (0.005)
Blaming health policy	-0.016*** (0.005)	-0.018*** (0.005)	-0.007 (0.005)	-0.008 (0.005)
Praising health policy	0.012** (0.005)	0.013*** (0.005)	0.006 (0.005)	0.007 (0.005)
Gravity economy	-0.001 (0.005)	-0.001 (0.005)	-0.008 (0.005)	-0.008* (0.005)
Blaming economic policy	0.000 (0.005)	0.000 (0.005)	-0.010** (0.005)	-0.010** (0.005)
Praising economic policy	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)
Individual controls		X		X
Country FE		X		X
Observations	22,541	22,541	22,541	22,541
R2	0.002	0.112	0.001	0.096
Outcome mean	0.509	0.509	0.502	0.502
Linear combination of estimates:				
Blaming - Praising health policy	-0.028*** (0.007)	-0.030*** (0.007)	-0.013* (0.007)	-0.015** (0.007)
Blaming - Praising economic policy	-0.004 (0.007)	-0.004 (0.007)	-0.014** (0.007)	-0.014** (0.007)

*Notes:* The dependent variable for columns 1 and 2 (resp. 3 and 4) is a variable ranging from 0 to 1 (with possible values: 0, 0.1, 0.2, etc.), measuring respondents’ level of satisfaction with the health (resp. economic) measures taken by the government to mitigate the Covid-19 pandemic. Question: “Are you satisfied with the health (resp. economic) measures taken by the government to mitigate the Covid-19 pandemic?”. Individual controls as in Table 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## E.4 First stage tables

Tables E.5 and E.6 present the results of the first stage, regressing the endogenous variables on the treatment dummies or on the summary instruments described in Appendix D.

Table E.5: Satisfaction with the health and economic measures, first stage.

	Health satisfaction				Economic satisfaction			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Health IV			0.030*** (0.005)	0.031*** (0.004)			0.007 (0.004)	0.008* (0.004)
Econ IV			0.005 (0.005)	0.005 (0.004)			0.021*** (0.004)	0.021*** (0.004)
TH1_TE1	0.026** (0.010)	0.027*** (0.010)			0.017* (0.010)	0.018* (0.009)		
TH1_TE2	0.025** (0.010)	0.026*** (0.010)			0.025** (0.010)	0.025*** (0.009)		
TH1_TE3	0.036*** (0.010)	0.036*** (0.010)			0.017* (0.010)	0.017* (0.009)		
TH1_TE4	0.038*** (0.010)	0.038*** (0.010)			0.015 (0.010)	0.015 (0.009)		
TH2_TE1	0.037*** (0.010)	0.038*** (0.010)			0.032*** (0.010)	0.033*** (0.009)		
TH2_TE2	0.062*** (0.010)	0.062*** (0.010)			0.044*** (0.010)	0.044*** (0.009)		
TH2_TE3	0.034*** (0.010)	0.036*** (0.010)			0.015 (0.010)	0.017* (0.009)		
TH2_TE4	0.038*** (0.010)	0.041*** (0.010)			0.007 (0.010)	0.008 (0.009)		
TH3_TE1	0.026** (0.010)	0.027*** (0.010)			0.029*** (0.010)	0.031*** (0.009)		
TH3_TE2	0.029*** (0.010)	0.032*** (0.010)			0.031*** (0.010)	0.033*** (0.009)		
TH3_TE3	0.021** (0.010)	0.020** (0.010)			0.018* (0.010)	0.017* (0.009)		
TH3_TE4	0.024** (0.010)	0.026*** (0.010)			0.007 (0.010)	0.008 (0.009)		
TH4_TE1	0.018* (0.010)	0.017* (0.010)			0.022** (0.010)	0.021** (0.009)		
TH4_TE2	0.006 (0.010)	0.005 (0.010)			0.017* (0.010)	0.017* (0.009)		
TH4_TE3	0.011 (0.010)	0.012 (0.010)			0.019** (0.010)	0.021** (0.009)		
Controls		X		X		X		X
Country FE		X		X		X		X
Observations	22,541	22,541	22,541	22,541	22,541	22,541	22,541	22,541
F-statistic	4.329	5.046	22.242	26.359	2.558	2.889	12.555	14.247

*Notes:* The dependent variable for columns 1 and 2 (resp. 3 and 4) is a variable ranging from 0 to 1 (with possible values 0, 0.1, 0.2, etc.), measuring respondents' level of satisfaction with the health (resp. economic) measures taken by the government to mitigate the Covid-19 pandemic. Question: "Are you satisfied with the health (resp. economic) measures taken by the government to mitigate the Covid-19 pandemic?". The F-statistic is computed on the excluded instruments only.

*TH4\_TE4* (group receiving comparatively negative messages also blaming the government on both health and the economy) is the omitted reference category in columns 1, 2, 5, and 6. Individual controls as in Table 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table E.6: Satisfaction with the head of government, first stage.

	Satisfaction with the head of government					
	(1)	(2)	(3)	(4)	(5)	(6)
Health IV			0.014*** (0.005)	0.014*** (0.005)		
Econ IV			0.008 (0.005)	0.008* (0.005)		
SumIV					0.011*** (0.004)	0.011*** (0.004)
TH1_TE1	0.011 (0.012)	0.013 (0.011)				
TH1_TE2	0.017 (0.012)	0.018 (0.011)				
TH1_TE3	0.008 (0.012)	0.008 (0.011)				
TH1_TE4	0.022* (0.012)	0.022** (0.011)				
TH2_TE1	0.029** (0.012)	0.030*** (0.011)				
TH2_TE2	0.041*** (0.012)	0.041*** (0.011)				
TH2_TE3	0.018 (0.012)	0.020* (0.011)				
TH2_TE4	0.017 (0.012)	0.018 (0.011)				
TH3_TE1	0.014 (0.012)	0.016 (0.011)				
TH3_TE2	0.020* (0.012)	0.023** (0.011)				
TH3_TE3	0.010 (0.012)	0.010 (0.011)				
TH3_TE4	0.013 (0.012)	0.015 (0.011)				
TH4_TE1	0.016 (0.012)	0.015 (0.011)				
TH4_TE2	0.005 (0.012)	0.005 (0.011)				
TH4_TE3	0.015 (0.012)	0.016 (0.011)				
Controls		X		X		X
Country FE		X		X		X
Observations	22,541	22,541	22,541	22,541	22,541	22,541
F-statistic	1.328	1.578	4.573	5.449	8.595	10.208

*Notes:* The dependent variable is a variable ranging from 0 to 1, measuring the level of satisfaction with the head of government (President / Prime minister / Chancellor). Question: "Generally speaking, are you satisfied or dissatisfied with the action of Prime Minister/Chancellor/President [name]?" The F-statistic is computed on the excluded instruments only. *TH4\_TE4* is omitted reference category in columns 1 and 2 (group receiving comparatively negative messages on both health and the economy also blaming the government). Individual controls as in Table 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## E.5 OLS estimates

Table E.7 estimates equation (2) in a simple OLS model. It shows the correlation between satisfaction with the head of government and our main variables of interest, with and without controls. Satisfaction with the head of government is strongly correlated with both satisfaction with democracy and support for democracy as a regime type. The corresponding coefficients are statistically significant at conventional levels. Given concerns about omitted variables and reverse causation, these correlations should not be interpreted causally.

Table E.7: OLS estimates of the correlation between satisfaction with the head of government and attitudes on democracy

	Satisfaction with democracy		Democracy (support)	
	(1)	(2)	(3)	(4)
Satisfaction with the head of government	0.543*** (0.005)	0.520*** (0.005)	0.046*** (0.006)	0.034*** (0.007)
Individual controls		X		X
Country FE		X		X
Observations	22,541	22,541	22,537	22,537
Outcome mean	0.500	0.500	0.902	0.902

*Notes:* The table reports OLS estimates. The dependent variable for columns 1 and 2 is the respondent's level of satisfaction with the way in which democracy works in their country, which ranges from 0 to 1, as in Table 3. The dependent variable for columns 3 and 4 is an indicator variable equal to 1 if the respondent thinks that a democracy is a good political system as in Table 4. Individual controls as in Table 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## E.6 Results on efficacy variables

Table E.8 presents the effects on people's perceived efficacy in the political process. While the sign of the satisfaction with the head of government variable is consistently positive, suggesting that a more positive view of the government may boost perceived efficacy, it is not statistically significant in most specifications.

Table E.8: Impact on political efficacy - 2SLS.

	External efficacy		Internal efficacy		Standardized index	
	(1)	(2)	(3)	(4)	(5)	(6)
Satisfaction with the head of government	0.459 (0.305)	0.134 (0.470)	0.073 (0.343)	0.539 (0.558)	0.909* (0.524)	1.223 (0.816)
Individual controls	X	X	X	X	X	X
Country FE	X	X	X	X	X	X
Observations	22,538	22,538	22,539	22,539	22,537	22,537
Outcome mean	0.312	0.312	0.588	0.588	0.000	0.000
Instruments	16 IVs	SumIV	16 IVs	SumIV	16 IVs	SumIV
F-statistic	1.575	10.214	1.559	10.047	1.558	10.040

*Notes:* The dependent variable in columns 1 and 2 is a dummy equal to 1 if the respondent does not agree with the statement that “The government does not care about how people like me think.” and 0 otherwise. The dependent variable in columns 3 and 4 is a dummy equal to 1 if the respondent does not agree with the statement that “Sometimes, politics and government are so complicated that a person like me can’t really understand what’s going on.” and 0 otherwise. The dependent variable in columns 5 and 6 is a standardized index computed by taking the average of the z-scores of the two underlying variables, which take values 1 to 5 (coded such that higher values correspond to higher efficacy). Question: “How much do you agree with the following statements?” [1. Politicians do not care much about what people like me think. 2. Sometimes politics and government are so complicated that a person like me can’t really understand what’s going on.] Satisfaction with the head of government is instrumented with the sixteen treatment dummies (columns 1, 3, and 5) or with the single summary instrument (columns 2, 4, and 6). Individual controls as in Table 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## E.7 Cross-national heterogeneity

### E.7.1 Robustness to excluding young democracies

Tables E.9 and E.10 show the robustness of the main results to the exclusion of younger democracies (Brazil and Poland).

Table E.9: Impact on satisfaction with democracy, excluding Brazil and Poland - 2SLS.

	Satisfaction with democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Satisfaction with the head of government	0.445*** (0.136)	0.445*** (0.130)	0.439** (0.192)	0.461** (0.183)	0.394* (0.214)	0.408** (0.202)
Individual controls		X		X		X
Country FE		X		X		X
Observations	20,539	20,539	20,539	20,539	20,539	20,539
Outcome mean	0.507	0.507	0.507	0.507	0.507	0.507
Instruments	16 IVs	16 IVs	2 SumIVs	2 SumIVs	SumIV	SumIV
F-statistic	1.631	1.921	6.091	7.107	10.045	11.938

*Notes:* We exclude Brazil and Poland from the sample. Other notes as in Table 3. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table E.10: Impact on support for democratic ideals, excluding Brazil and Poland - 2SLS.

	Strong leader		Experts		Army		Democracy	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Satisfaction with the head of government	-0.017 (0.290)	0.164 (0.448)	0.133 (0.317)	0.058 (0.486)	-0.395 (0.246)	-0.403 (0.386)	0.043 (0.189)	0.099 (0.289)
Individual controls	X	X	X	X	X	X	X	X
Country FE	X	X	X	X	X	X	X	X
Observations	20,534	20,534	20,535	20,535	20,534	20,534	20,536	20,536
Outcome mean	0.305	0.305	0.584	0.584	0.169	0.169	0.907	0.907
Instruments	16 IVs	SumIV	16 IVs	SumIV	16 IVs	SumIV	16 IVs	SumIV
F-statistic	1.897	11.726	1.905	11.806	1.903	11.720	1.919	11.768

Notes: We exclude Brazil and Poland from the sample. Other notes as in Table 4. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

### E.7.2 Heterogeneity based on country situation at the time of the experiment

Table E.12 explores heterogeneity in the relationship between satisfaction with the head of government and satisfaction with democracy depending on the country situation at the time of interview. We separate countries in two groups for each dimension: countries with high and low mortality and countries with high and low economic losses. As in Galasso et al. (2021), to define the groups, we use deaths rates per capita and GDP decline in 2020. Deaths rate come from the Covid-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (Dong, Du and Gardner, 2020) as in Table 1. GDP decline comes from the World Bank national accounts data and from OECD National Accounts data files. For the health exposure, we split countries between those that had a death rate above vs. below 200 per million inhabitants at the time of the experiment. For the economic situation, we split countries between those that had a decline in GDP above vs. below 5%. The full classification is displayed in Table E.11.

Table E.11: Country classification based on exposure at time of interview

	Low Economic Losses	High Economic Losses
Low Mortality	Australia, Germany, New Zealand, Poland	Austria
High Mortality	Brazil, Sweden, US	France, Italy, Spain, UK

We use a two-stage-least-square approach to re-estimate equation (2), where we introduce a dummy variable that takes on a value of one if the country belongs to the high mortality group (or high economic losses group), and interact it with the instruments, in the first stage, and with the endogenous variable, in the second stage. The estimation yields a negative coefficient on the interaction for both mortality and economic losses, suggesting that the relationship between satisfaction with the head of government and satisfaction with democracy is somewhat stronger in countries with lower exposure to Covid-19. However, the interaction coefficients are not statistically significant at conventional levels. It is noteworthy that the effect of government satisfaction on satisfaction with democracy is significant in all four groups: countries with below and above median mortality, and countries with below and above median economic outlook.

Table E.12: Impact on satisfaction with democracy, depending on exposure to Covid-19

	Satisfaction with democracy		
	(1)	(2)	(3)
Satisfaction with the head of government	0.476** (0.220)	0.666* (0.353)	0.806** (0.364)
High mortality × satisfaction with the head of government		-0.176 (0.433)	
High econ losses × satisfaction with the head of government			-0.380 (0.407)
High mortality country		0.076 (0.231)	
High economic losses country			0.155 (0.202)
Individual controls			
Country FE			
Observations	22,541	22,541	22,541
Outcome mean	0.500	0.500	0.500
Instruments	2 SumIVs	2 SumIVs	2 SumIVs
F-statistic	4.573	2.016	0.970
Linear combination of estimates			
Satisfaction with the head of government + High mortality × satisfaction with the head of government		.489* (0.250)	
Satisfaction with the head of government + High economic losses × satisfaction with the head of government			.427** (0.181)

Notes: Groups define as per table E.11. Other notes as in Table 3. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## E.8 Individual Heterogeneity

### E.8.1 Heterogeneity in observables

Our instrumental variables estimation relies on the fact that variation in the designed-based instruments shifts the performance evaluation (or satisfaction with the executive) of a respondent. A relevant question is whether these shifts are homogeneous across individuals or not.

We first explore individual-level heterogeneity in the first stage based on observable characteristics, by interacting our instruments with several observed demographic variables.<sup>2</sup> Figure E.1 plots the coefficients of the interaction terms. We find that only three coefficients are statistically significant.<sup>3</sup> Specifically, our findings suggest that women display a greater response to the health treatment than men and that they exhibit a more pronounced shift in their evaluation of the government’s health policy. However, we observe no gender-based difference in the evaluation of economic policies and in overall satisfaction with the government. Older respondents also appear slightly more responsive on the health dimension though that gap is not statistically significant. College graduates seem to update less their level of satisfaction with the head of government than non-college graduates, all the while being more responsive to economic messages, though this last coefficient is not statistically significant at the 5% level. Respondents without religion, on the contrary, update more their level of satisfaction with the government than those with a stated religion. Furthermore, individuals who have not declared a religion exhibit a greater response to the treatment by demonstrating an increased shift in their satisfaction with both the government’s health policy and the overall satisfaction with the head of government. However, only the latter is statistically significant at the 5% level.

<sup>2</sup>We use a specification with two summary instruments for comparability, though results are qualitatively equivalent in a specification with 16 dummies and one summary instrument.

<sup>3</sup>Note that we do not apply a correction for multiple testing.



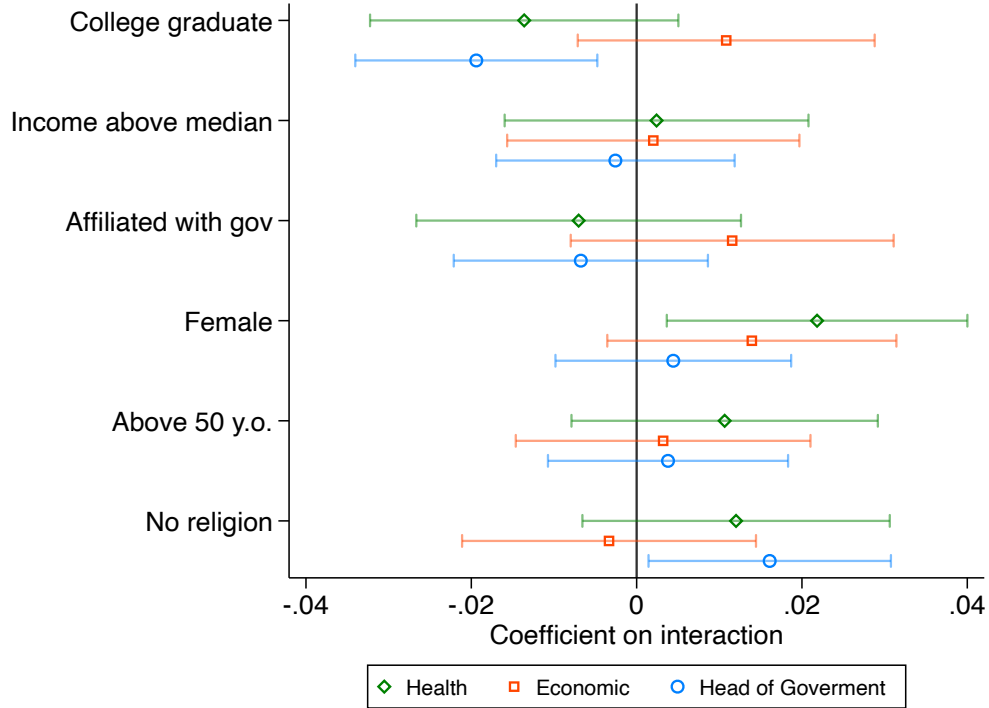


Figure E.1: Individual heterogeneity

*Notes:* The figure shows the interaction coefficients between six demographic variables and the treatment summary instrument. For the health and economic treatments, we use their respective summary instruments. For satisfaction with the head of government, we use the single summary instrument combining the two dimensions, as described in Appendix D. Italy and the U.K. are excluded from the sample as the religion variable is missing in Italy and the education variable is missing in the U.K. We report 95% confidence intervals.

## E.8.2 Heterogeneity in unobservables

We continue our exploration of individual-level heterogeneity in the first stage by allowing for heterogeneity in unobservables. We use an instrumental variables estimator that allows for fully heterogeneous treatment effects. Under the assumption discussed below, the model estimates average partial effects in the full sample. Therefore, it enables us to assess the generalizability of the estimates reported in Table 1 and 2, which measure local treatment effects for the respondents responding to the treatment. This is of particular interest in our application where we have multiple instruments, and where different instruments may shift different subsets of the population (those that react to or “comply” with the instrument), so that the reported effects are weighted averages of different local treatment effects (e.g., Angrist, 2004, C57).

The model we consider is

$$Y = B_0 + \sum_{j=1}^{d_x} B_j X_j + \sum_{j=1}^{d_1} B_{d_x+j} Z_{1j}, \quad (\text{E.3})$$

where  $X$  are  $d_x$  endogenous variables (either two performance evaluations, or satisfaction with the executive) and  $Z_1$  are exogenous variables. In addition to  $Z_1$ , there is a vector  $Z_2$  of excluded exogenous variables (the design-based instruments) that do not directly affect  $Y$ . Write the combination of all exogenous variables (i.e., included and excluded instruments) as  $Z = (Z_1', Z_2')'$ . Both the intercept  $B_0$  and the coefficients  $B_j$  are random variables. In other words, they allow for effect heterogeneity across individuals. The endogenous variables are allowed to arbitrarily depend on  $B$ . This means that the individual-specific impact of, say,

performance evaluations on satisfaction with the executive can be arbitrarily related to that individual’s probability to choose a higher evaluation in the first place (following exposure to the experimental treatment). Wooldridge (1997, 2003) and Heckman and Vytlacil (1998) show that only under the assumption of *no unobserved heterogeneity* in the effect of the instrument on the endogenous variables does standard 2SLS estimate the mean of the random coefficients.<sup>4</sup> In other words, this estimator allows for heterogeneity in the effect of  $X$  on  $Y$  but permits no heterogeneity in  $Z$  on  $X$ . A growing literature proposes estimators that—under alternative assumptions—permit heterogeneity in the instrument stage as well (Angrist, 2004). Here, we follow the proposal by Masten and Torgovitsky (2016), which can accommodate multiple endogenous variables.

**Estimator** For brevity of exposition, collect all included variables (including the intercept) into  $W = (1, X', Z_1)'$  and the corresponding coefficients into  $B$ . The resulting model is now simply  $Y = W'B$ . The identification strategy (Masten and Torgovitsky, 2014, 2016) uses a control function approach (Smith and Blundell, 1986, Imbens and Newey, 2009). Assume that there is an observable control variable  $R$  which fulfills the criterion

$$W \perp B | R, \tag{E.4}$$

where  $\perp$  denotes independence, and thus both  $X$  and  $Z_1$  are exogenous after conditioning on  $R$ . This control function will be constructed from our design-based instruments via quantile regression (described below). Using the control function, one can consistently estimate  $\beta(r) = E(B|R = r)$  by a weighted linear regression of  $Y$  on  $W$  while conditioning on  $R = r$  (Masten and Torgovitsky, 2014). For this strategy to work, there must be variation in  $X$  after conditioning on  $R = r$  (technically,  $E(WW'|R = r)^{-1}$  has to exist). Using a kernel-weighted regression estimator (for a sample of  $n$  observations) implements conditioning by specifying weights for each observation  $i$  that are equal to the distance of  $r$  from  $R$ .

$$\hat{\beta}(r) = \left( \sum_{i=1}^n k_i^h(r) W_i W_i' \right)^{-1} \left( \sum_{i=1}^n k_i^h(r) W_i Y_i \right). \tag{E.5}$$

The weights  $k_i^h$  are given by  $h^{-1}K[(R_i - r)/h]$ , where  $K$  is the Epanechnikov kernel with bandwidth parameter  $h > 0$  to be chosen a priori. The choice of a bandwidth implies the usual bias-variance trade-off. In our application, we set  $h$  to  $h_{ROT}$  selected using the rule of thumb proposed by Fan and Gijbels (1996), but we also make sure that our results are similar when using  $h_{ROT}/2$ . Similarly, we also ensured that the choice of kernel does not affect our substantive conclusions. With estimates of  $\beta(r)$  in hand, one can obtain the ultimate quantities of interest,  $E(B)$ , by simply averaging, i.e.,  $E(B) = E(\beta(r))$  (Masten and Torgovitsky, 2016, 1002).

**Construction of the control function** Assume that each endogenous variable  $X_j (j = 1, \dots, d_x)$  is generated as a function of instruments and continuously distributed unobservables  $V_j$

$$X_j = h_j(Z, V_j) \tag{E.6}$$

where  $h_j(z, \cdot)$  is an unknown function that is strictly increasing for each  $z$ . Note that this restricts unobserved heterogeneity to be one-dimensional (while this is a strong untestable assumption, it is of course less restrictive than assuming no heterogeneity or heterogeneity in observables only; see Masten and Torgovitsky (2016, 1003) and Heckman, Smith and Clements (1997) for further discussion). The control function for each endogenous variable is constructed by estimating the relative position of  $X_j$  given the instrument  $Z$ . More formally, we estimate the conditional ranks  $R_j = F_{X_j|Z}(X_j|Z)$  where  $F_{X_j|Z}(x_j|z) = P(X_j \leq x_j | Z = z)$  is the conditional distribution function of  $X_j$  given  $Z$ . This can be estimated by first using a quantile regression

<sup>4</sup>In contrast, if there is first-stage heterogeneity (i.e., a random coefficient on the instrument), then 2SLS estimates a weighted average of the treatment effect parameters, similar to the weighted average of local average treatment effects shown by Angrist and Imbens (1995).

of  $X$  on  $Z$  to estimate conditional quantile functions (at increasing quantile positions) and then inverting them to get the conditional distribution function. See [Masten and Torgovitsky \(2014\)](#) and [Chernozhukov, Fernández-Val and Galichon \(2010\)](#) for details. In our application the endogenous survey variables are pseudo-continuous and we use quintiles (i.e., five quantiles).

[Imbens and Newey \(2009\)](#) and [Masten and Torgovitsky \(2016\)](#) show that  $R = (R_1, \dots, R_{d_x})'$  is a valid control function if  $(B, V) \perp Z$ . In other words, the estimator hinges crucially on the exogeneity of the excluded instruments. Fortunately, in our applications, the instrumental variables are exogenous by design.

Table E.13: Instrumental variables estimates allowing for treatment effect heterogeneity in first and second stage.

	Satisfaction with the head of government		Satisfaction with democracy		
	(1)	(2)	(3)	(4)	(5)
Economic satisfaction	0.415*** (0.035)	0.414*** (0.035)			
Health satisfaction	0.585*** (0.037)	0.585*** (0.037)			
Satisfaction with the head of government			0.527*** (0.072)	0.541*** (0.095)	0.549*** (0.090)
Instruments	16	2	16	2	1
Bandwidth $h$	0.0196	0.0269	0.0192	0.0166	0.0163
N	22,530	22,530	22,530	22,530	22,530

*Notes:* Correlated random coefficient instrumental variable estimator of [Masten and Torgovitsky \(2016\)](#). Bootstrapped standard errors based on 500 replicates. Kernel regression bandwidth  $h$  chosen by rule of thumb method of [Fan and Gijbels \(1996\)](#). Excluded instruments are 16 treatment dummies (cols. 1 and 3), two summary instruments (cols. 2 and 4), and the overall summary instrument (col. 5). See Appendix D for the construction of summary instruments. Controls include gender, age (50+), indicator variables for income quartile, and an indicator of good health.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Results** Table E.13 shows the resulting estimates of  $E(B)$ . To carry through uncertainty from all estimation steps, standard errors are based on a nonparametric bootstrap using 500 replicates. The first two columns present models for the satisfaction with the head of government as a function of economic and health satisfaction using the 16 treatment dummy instruments and the two summary instruments, respectively (as in Table 2 in the main text). The final three columns show models for satisfaction with democracy as a function of satisfaction with the executive instrumented using the 16 treatment dummies, two summary instruments, as well as the single summary instrument (as in Table 3 in the main text).

The estimated effects of satisfaction with health and economic responses on people’s satisfaction with the government leader are statistically significant and comparable to the 2SLS estimates in Table 2. They are somewhat larger (especially for the effects of health satisfaction), but are still within the confidence intervals of the 2SLS estimates. The estimated effect of satisfaction with the head of government on satisfaction with democracy is close to the estimates in Table 3 (again, somewhat larger but within the range of the confidence intervals of the 2SLS estimates). The results are robust to using all sixteen treatment dummies or the summary instruments. Thus, we conclude that using an estimator that allows for unobserved heterogeneity in both the first and the second stage of the instrumental variable analysis and that targets the average partial effect of satisfaction on the respective outcomes, confirms the basic pattern of our main results.

## E.9 Robustness to using only blaming and praising the government as instruments

To address concerns about a possible violation of the exclusion restriction, a first test of the robustness of our results uses only the treatments blaming or praising the government (TH2, TH4, TE2, and TE4 only) as instruments for the endogenous variables. This specification also includes dummy variables for the gravity of the health and economic crisis ((TH3 = 1 or TH4 = 1) and (TE3 = 1 or TE4 = 1)) as control variables, so that the instruments only capture the information provided on the policy response itself. Equation (E.7) displays the first stage where the endogenous variable (satisfaction with the head of government) is regressed on the dummies corresponding to the four treatment groups mentioning the government. Equation (E.8) adds interactions between these treatment dummies.

The treatment dummies are the only excluded instruments since both the Gravity dummies are included in the second stage as well (Equation (E.8)).

**First stage 4 IVs:**

$$SatisHead_i = \beta_0 + \beta_1 TH2_i + \beta_2 TH4_i + \beta_3 TE2_i + \beta_4 TE4_i + GravityHealth_i + GravityEconomy_i + \gamma X_i + u_i \quad (\text{E.7})$$

**First stage 8 IVs:**

$$SatisHead_i = \beta_0 + \beta_1 TH2_i + \beta_2 TH4_i + \beta_3 TE2_i + \beta_4 TH4_i + \beta_5 TH2_i TE2_i + \beta_6 TH2_i TE4_i + \beta_7 TH4_i TE2_i + \beta_8 TH4_i TE4_i + GravityHealth_i + GravityEconomy_i + \gamma X_i + u_i$$

**Second stage:**

$$Y_i = \alpha_0 + \alpha_1 \widehat{SatisHead}_i + GravityHealth_i + GravityEconomy_i + \gamma X_i + v_i \quad (\text{E.8})$$

with  $GravityHealth_i = \mathbf{1}(TH3_i = 1 \text{ or } TH4_i = 1)$ , and  $GravityEconomy_i = \mathbf{1}(TE3_i = 1 \text{ or } TE4_i = 1)$ .

Tables E.14 and E.15 present the results for satisfaction with democracy and support for democracy as a regime type. We conduct a Hausman test of equality of the models (this model and the model in the main text), as well as a Z-test of equality of coefficients across the two models. In Table E.14, the point estimates on satisfaction with the head of government are relatively similar whether we use all treatment dummies (columns 1 and 2) or only the dummies mentioning the government (columns 3 and 4). Neither the Hausman nor the Z-test conclude to a rejection of the null hypothesis that coefficients are identical. The results for democratic regimes in Table E.15 are also in line with the estimates in the main text.

Table E.14: Impact on satisfaction with democracy, treatments mentioning government - 2SLS.

	Satisfaction with democracy			
	(1)	(2)	(3)	(4)
Satisfaction with the head of government	0.522*** (0.149)	0.528*** (0.143)	0.520*** (0.191)	0.536*** (0.180)
Gravity economy			0.000 (0.003)	0.001 (0.003)
Gravity health			-0.001 (0.003)	-0.001 (0.003)
Individual controls		X		X
Country FE		X		X
Observations	22,541	22,541	22,541	22,541
Outcome mean	0.500	0.500	0.500	0.500
Instruments	16 IVs	16 IVs	8 IVs	8 IVs
F-statistic	1.328	1.578	1.519	1.867
Hausman test p-value			0.990	1.000
Z-test p-value			0.995	0.974

*Notes:* We only use government blaming and praising as instruments. Individual controls as defined in Table 2. Columns 1 and 2 are identical to columns 1 and 2 of Table 3 in the main text. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table E.15: Impact on support for democracy, treatments mentioning government - 2SLS.

	Democracy			
	(1)	(2)	(3)	(4)
Satisfaction with the head of government	0.034 (0.217)	0.102 (0.208)	0.054 (0.274)	0.100 (0.260)
Gravity economy			-0.001 (0.004)	-0.000 (0.004)
Gravity health			-0.000 (0.005)	-0.000 (0.004)
Individual controls		X		X
Country FE		X		X
Observations	22,537	22,537	22,537	22,537
Outcome mean	0.902	0.902	0.902	0.902
Instruments	16 IVs	16 IVs	8 IVs	8 IVs
F-statistic	1.330	1.580	1.527	1.871
Hausman test p-value			0.905	1.000
Z-test p-value			0.954	0.995

*Notes:* We only use only government blaming and praising as instruments. Individual controls as defined in Table 2. Column 2 is identical to column 7 of Table 4 in the main text. \*\*\*  $p < .01$ , \*\*  $p < 0.05$ , \*  $p < .1$

## E.10 Robustness to adding intermediary endogenous variables

Another test of the robustness of our results against a possible violation of the exclusion restriction is to include other intermediary endogenous variables as regressors. In particular, we include our measures of the seriousness of the crisis as additional endogenous variables in the model, which served as dependent variables in the first part of our analysis. We are able to incorporate these additional variables into the instrumental variable analysis thanks to our large number of instruments generated through the experiment. Equations (E.9) and (E.10) show the first and second stages.

**First stage 16 IVs (15 since one is excluded):**

$$\begin{aligned}
 SatisHead_i &= \beta_0 + \beta_1 TH_1 TE1 + \beta_2 TH_1 TE2_i + \beta_3 TH_1 TE3_i + \beta_4 TH_1 TE4_i + \dots + \beta_5 TH_4 TE3_i + \gamma X_i + u_i \\
 VerySeriousHealthCsqc_i &= \omega_0 + \omega_1 TH_1 TE1_i + \omega_2 TH_1 TE2_i + \omega_3 TH_1 TE3_i + \omega_4 TH_1 TE4_i + \dots + \omega_5 TH_4 TE3_i \\
 &\quad + \gamma X_i + u_i \\
 VerySeriousEconCsqc_i &= \eta_0 + \eta_1 TH_1 TE1_i + \eta_2 TH_1 TE2_i + \eta_3 TH_1 TE3_i + \eta_4 TH_1 TE4_i + \dots + \eta_5 TH_4 TE3_i \\
 &\quad + \gamma X_i + u_i
 \end{aligned}
 \tag{E.9}$$

**Second stage:**

$$Y_i = \alpha_0 + \alpha_1 \widehat{SatisHead}_i + \alpha_2 \widehat{VerySeriousHealthCsqc}_i + \alpha_3 \widehat{VerySeriousEconCsqc}_i + \gamma X_i + v_i \tag{E.10}$$

Tables E.16 and E.17 present the results. In Table E.16, the point estimate on satisfaction with the head of government is very robust to the inclusion of “very serious health consequences” and “very serious economic consequences” as additional endogenous variables. Table E.17 shows the impact of satisfaction with the head of government on support for democracy as a regime type. The point estimate remains non-significant, and we cannot reject the null that the estimates in the baseline and extended models are identical.

Table E.16: Impact on satisfaction with democracy, additional regressors - 2SLS.

	Satisfaction with democracy			
	(1)	(2)	(3)	(4)
Satisfaction with the head of government	0.522*** (0.149)	0.528*** (0.143)	0.443** (0.199)	0.443** (0.199)
Very serious health consequences			-0.026 (0.044)	-0.026 (0.044)
Very serious economic consequences			-0.008 (0.037)	-0.008 (0.037)
Individual controls		X		X
Country FE		X		X
Observations	22,541	22,541	22,537	22,537
Outcome mean	0.500	0.500	0.500	0.500
Instruments	16 IVs	16 IVs	16 IVs	16 IVs
Cragg-Donald statistic	1.328	1.578	0.807	0.807
Hausman test p-value			0.548	1.000
Z-test p-value			0.753	0.728

Notes: Individual controls as defined in Table 2. Columns 1 and 2 are identical to columns 1 and 2 of Table 3 in the main text. \*\*\*  $p < .01$ , \*\*  $p < 0.05$ , \*  $p < .1$

Table E.17: Impact on support for democracy, additional regressors - 2SLS.

	Democracy			
	(1)	(2)	(3)	(4)
Satisfaction with the head of government	0.034 (0.217)	0.102 (0.208)	-0.132 (0.289)	-0.132 (0.289)
Very serious health consequences			-0.021 (0.063)	-0.021 (0.063)
Very serious economic consequences			-0.048 (0.053)	-0.048 (0.053)
Individual controls		X		X
Country FE		X		X
Observations	22,537	22,537	22,533	22,533
Outcome mean	0.902	0.902	0.902	0.902
Instruments	16 IVs	16 IVs	16 IVs	16 IVs
Cragg-Donald statistic	1.330	1.580	0.811	0.811
Hausman test p-value			0.381	1.000
Z-test p-value			0.647	0.511

*Notes:* Individual controls as defined in Table 2. Column 2 is identical to column 7 of Table 4 in the main text. \*\*\*  $p < .01$ , \*\*  $p < 0.05$ , \*  $p < .1$

## E.11 Analyzing satisfaction with the regional government

In the pandemic, subnational governments often also played a relevant and visible role. Unilaterally or in collaboration with the national government, for instance, state governments in many countries made decisions about public health measures. Given our theory, we want to know, first, if our treatments affected evaluations of regional governments' crisis management, and, second, if our results on the impact of evaluations of the head of government on democratic satisfaction are robust to accounting for evaluations of the regional government. This is not part of our main analysis, as the relevant question on regional government was quite distant from our experiment in the survey (after all the outcome variables) and it was not included in surveys conducted in Australia and the U.S. Thus, it is not included in our pre-analysis plan. With this caveat in mind, the following exploratory analysis is nonetheless instructive.

Satisfaction with the regional government is measured using the following question: "Generally speaking, are you satisfied with the way that the regional government is handling coronavirus?" Answers are recorded on a four-point scale ranging from 1 = "Completely satisfied" to 4 = "Not at all satisfied." For the analysis, the coding has been reverted and rescaled to range between 0 (not at all satisfied) and 1 (completely satisfied). Note that in contrast to the question about satisfaction with the chief executive, this question is not a summary evaluation of the regional government in that it explicitly asks about the coronavirus, priming people to think about public health related performance.

First, Table E.18 shows that the experimental treatments on the health dimension of the crisis affect satisfaction with the regional government. Respondents who received a vignette that describes a serious health situation compared to normal years are significantly less satisfied with the regional government's management of the crisis. This is consistent with the overall argument. As one would expect, there is no corresponding significant effect of the economic treatment on satisfaction with the regional government's management of the coronavirus.

Second, Table E.19 reports results from an instrumental variable analysis including satisfaction with the regional government as an explanatory variable for satisfaction with the democracy. For comparability, since two countries are dropped from the sample used to study satisfaction with the regional government, columns 1 and 2 display our baseline specification estimating the impact of satisfaction with the head of government on satisfaction with democracy. Using all 16 instruments, this yields a result which is very close as in the full sample. Next, columns 3 and 4 use satisfaction with the regional government rather than satisfaction with the head of government as the explanatory variable. This analysis yields a large and

statistically significant coefficient on satisfaction with the regional government. Finally, columns 5 and 6 include both variables as endogenous regressors. Both coefficients retain their positive sign and their size remains politically relevant, though the coefficient on satisfaction with the head of government is larger and the coefficient on satisfaction with the regional government does not reach conventional levels of statistical significance. This makes sense given that some of the experimental variation concerned the economy, and the blaming and praising treatments are explicitly about the national government.

Table E.18: Impact of the health and economic consequences of the crisis on satisfaction with the regional government.

	Satisfaction with the regional government	
	(1)	(2)
Gravity health	-0.008** (0.004)	-0.008** (0.003)
Gravity economy	-0.004 (0.004)	-0.005 (0.003)
Individual controls		X
Country FE		X
Observations	19,523	19,523
R2	0.000	0.065
Outcome mean	0.566	0.566

*Notes:* Australia and the U.S. are dropped from the sample. Individual controls as defined in Table 2. Question: “Generally speaking, are you satisfied with the way that your regional government is handling coronavirus?” \*\*\*  $p < .01$ , \*\*  $p < 0.05$ , \*  $p < .1$

Table E.19: Impact of satisfaction with the regional government on satisfaction with democracy.

	Satisfaction with democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Satisfaction with the head of government	0.497*** (0.156)	0.512*** (0.146)			0.421* (0.226)	0.409* (0.218)
Satisfaction with the regional government			0.652** (0.309)	0.706** (0.291)	0.166 (0.358)	0.225 (0.346)
Individual controls		X		X		X
Country FE		X		X		X
Observations	19,525	19,525	19,523	19,523	19,523	19,523
Outcome mean	0.493	0.493	0.493	0.493	0.493	0.493
Instruments	16 IVs	16 IVs	16 IVs	16 IVs	16 IVs	16 IVs
Cragg-Donald statistic	1.248	1.501	0.746	0.849	0.396	0.426
Hausman test p-value					0.638	1.000
Z-test p-value					0.783	0.692

*Notes:* Australia and the U.S. are dropped from the sample. Individual controls as defined in Table 2. Columns 1 and 2 use the same specification as columns 1 and 2 of Table 3 in the main text. \*\*\*  $p < .01$ , \*\*  $p < 0.05$ , \*  $p < .1$

## F Aggregate trends

Figure F.1 shows the evolution of public satisfaction with the head of the government and satisfaction with democracy between March and July 2020, at the beginning of the pandemic. It is based on the comparative panel survey that included our experiment, and excludes four countries (Brazil, Poland, Spain, and Sweden) because of missing data from March and April. The figure shows that satisfaction with the head



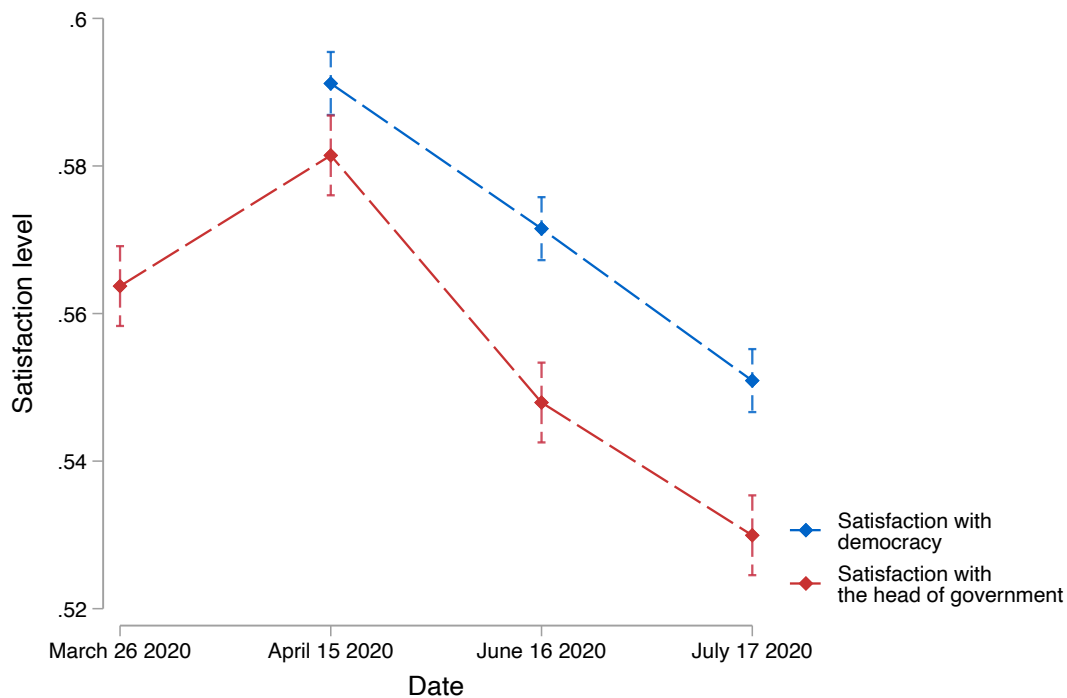


Figure F.1: Aggregate trends in the main variables of interest

of government and with democracy both declined during the pandemic. Satisfaction with the incumbent moderately increased in the first two weeks of April 2020. This is consistent with a boost in popularity due to the lockdowns enacted at the time in a majority of the countries (Bol et al., 2021). Thereafter, however, satisfaction with the government declined steadily by about 9% in total, dropping 6% below the starting point. The decline in satisfaction with democracy shows the same negative slope. It decreased by 7% in just three months.

As previously noted, the primary objective of this study is not to estimate the comprehensive impact of the pandemic. One might still wonder what share of the decline in the satisfaction with democracy, observed on Figure F.1, can be explained by the decline in satisfaction with the head of government. A back of the envelope calculation suggests that out of the 4.0 percentage points decrease in satisfaction with democracy observed between 15 April 2020 and 17 July 2020, 2.4 percentage points (60%) can be attributed to the decline in the satisfaction with the head of government. This number is obtained by multiplying the decline in the satisfaction with the head of government over the period (5.1 percentage points) by our preferred estimate of the impact of satisfaction with the head of government on satisfaction with democracy: 0.468 (Table 3, col. 6).

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