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ABSTRACT

Collective Negative Shocks and Preferences for Redistribution: Evidence from the COVID-19 Crisis in Germany*

Using new data from a three-wave panel survey administered in Germany between May 2020 and May 2021, this paper studies the impact of a negative shock affecting every strata of the population, such as the development of COVID-19, on preferences for redistribution. Exploiting the plausibly exogenous change in severity of the infection rate at the county level, we show that, contrary to some theoretical expectations, the worse the crisis, the lower the support for redistribution of our respondents. We provide further suggestive evidence that this is not driven by a decrease in inequality aversion, but this might be the result of a decrease in trust in the institutions who are in charge of redistributive policies.

JEL Classification: D31, D63, D72

Keywords: preference for redistribution, inequality aversion, COVID-19

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1 Introduction

Income and wealth distribution differs substantially between countries (Piketty, 2018); part of these differences can be explained by different preferences for redistribution since individuals' support for income redistribution crucially influences the implementation of redistributive policies (Alesina and Giuliano, 2011; Alesina et al., 2004, 2001). However, understanding what affects people's demand for income redistribution remains a challenge. Preferences for redistribution depend on several factors such as self-interest (Meltzer and Richard, 1981), fairness concerns (Alesina and Angeletos, 2005; Benabou and Tirole, 2006), trust in institutions (Algan et al., 2011; Kuziemko et al., 2015), and macroeconomic factors (Giuliano and Spilimbergo, 2014; Roth and Wohlfart, 2018), to name a few.

To explore further how these preferences are formed and, possibly, changed, in this paper we study the impact of a negative shock affecting every strata of the population, such as the development of COVID-19, on preferences for redistribution.

Previous research suggests that such unexpected events affect people's attitudes towards redistribution through different drivers. One possible channel through which unexpected shocks influence preferences for redistribution is by shifting people's normative views. Research shows that fairness concerns and beliefs about luck and merit affect preferences for redistribution (Alesina and Angeletos, 2005; Benabou and Tirole, 2006; Piketty, 1995). If people believe that income inequality is the outcome of a fair, meritocratic process, they are less likely to support redistribution. On the other hand, if people believe that inequality is due to causes beyond individuals' control, they demand more redistribution (Almås et al., 2010, 2020; Cappelen et al., 2007). Gualtieri et al. (2019) use Italian data to test this channel and show that the experience of an earthquake increases support for redistribution even among those who do not incur any material damage. This result is explained by the fact that an exogenous negative shock might push people to believe that economic success is mainly due to random luck, rather than merit, thus increasing demand for redistribution. Another driver of redistributive preferences is the insurance against labor, or income shocks. Supporting this line of thought, Esarey et al. (2012) show in a laboratory experiment that people demand more redistribution when facing a probable (negative) income shock. However, when the probability of the random shock is moderate, only left-oriented individuals support income redistribution. Finally, the literature on preferences for redistribution shows that people support income redistribution if they have sufficient trust in the government (Kuziemko et al., 2015). Handling unexpected crises poses a challenge to political institutions and people might mistrust institutions if they feel that crises of this type are mismanaged. In this

regard, Daniele et al. (2020) show the effects of the current pandemic crisis on political opinions with a survey experiment. The authors find that the COVID-19 crisis decreases the willingness to support the welfare state and it also decreases trust in institutions and interpersonal trust.

Overall, the literature shows that an unexpected negative shock such as a natural disaster or a pandemic might have contrasting effects on preferences for redistribution. If a natural disaster pushes people to think that economic success ultimately depends on luck, rather than effort, we might expect an increase in support for redistribution. However, if a natural disaster induces people to lose trust toward the government, the demand for redistribution might decrease.

To show how the pandemic shock might affect support for redistribution we run a survey on a sample of around 3,000 individuals in Germany, at three different stages of the crisis. The timing of our survey allows us to take advantage of the unexpected increase in the number of deaths and cases that have hit Germany since autumn 2020. The first wave of our survey was collected in late May 2020, when Germany reported a relatively low number of deaths and infections due to the new virus. The second wave was collected at the beginning of November 2020, when COVID-19 started to hit Germany hard. Indeed, the number of deaths related to the virus were doubled in November compared with May, and starting from December 2020, Germany has been forced to implement a strict lockdown. Finally, the third wave was collected in May 2021, when COVID-19-related cases and deaths were decreasing but were still high if compared with the previous year. To identify the effect of the pandemic on individual preferences, we link data on the number of COVID-19 cases at county (Landkreis) level with individual data on preferences for redistribution. We include in our regressions a set of variables to control for subjective assessments about the COVID-19 crisis, and we include some standard socio-demographics controls, such as employment conditions, that might be affected by the crisis. Furthermore, and most importantly, the panel structure of our data allows us to control for individual unobservable heterogeneity. We find that an increase in the number of COVID-related cases leads to a decrease in the support for redistribution. Thanks to the specificity of our survey, we are also able to investigate several aspects that might drive our result. We suggest that the decrease in support for redistribution is not because people become less inequality averse, as we find also that an increase in the number of COVID-related cases leads to an increase of inequality aversion. Rather, we find that an increase in the number of COVID-related cases leads to a decrease in trust towards the institutions. This might indicate that at least part of the lower support for redistribution is driven by a general decrease in institutional trust. Overall, our results suggest that the pandemic crisis might have affected both people's redistributive preferences and normative views about inequality in an opposite way.

Our results contribute to three strands of the literature. First, we add to the literature studying individual preferences for redistribution. The standard model by Meltzer and Richard (1981) suggests that people below the median income demand more redistribution since they can benefit from it. However, self-interest alone cannot provide a complete explanation of the functioning of redistributive preferences as they are influenced by several factors (Alesina and Giuliano, 2011; Corneo and Grüner, 2002; Fong, 2001; Sabatini et al., 2020; Scervini, 2012). We add to this complex puzzle by pinpointing the different effects that a natural disaster such as a pandemic crisis might have on support for redistribution, trust in institutions and inequality aversion.

Second, we contribute to the literature linking the COVID-19 crisis to individual preferences and political attitudes. Research has shown that the pandemic crisis affects people's views on a number of outcomes such as trust in national governments (Aksoy et al., 2020; Esaiasson et al., 2020; Fazio et al., 2021; Fetzer et al., 2020b; Lazarus et al., 2020), economic anxiety (Fetzer et al., 2020a) and support for safety-net programs (Balasundharam et al., 2021; Rees-Jones et al., 2020). Asaria et al. (2021) investigate the effect of the pandemic shock on income and health inequality aversion in the UK, Italy, and Germany. The authors find that to report a health or income shock due to the pandemic is associated with lower inequality aversion. However, when implementing a difference-in-differences analysis, the exposure to health or income shocks affects inequality aversion only for individuals belonging to high-risk groups. Cappelen et al. (2021) show through a survey experiment in the US that the COVID-19 crisis makes people more willing to accept inequalities due to luck. Since the moral views on inequality are usually related to preferences for redistribution, the authors suggest that this shift in moral views might affect support for redistributive policies. Our main contribution is to provide a broad and consistent picture of the way in which the pandemic might affect redistributive preferences and inequality aversion.

Last, we contribute to the literature on natural disasters and individual attitudes. Natural disasters affect individual attitudes such as trust and risk attitudes (Bourdeau-Brien and Kryzanowski, 2020; Cassar et al., 2017; Hanaoka et al., 2018) or voting behavior (Goebel et al., 2015; Masiero and Santarossa, 2020). We add to this literature by showing the effects of a pandemic crisis on individual redistributive preferences.

The paper develops as follows: the next section briefly summarizes the COVID-19 pandemic in Germany. Section 3 describes the data and the main variables we use. Section 4 depicts our identification strategy. Section 5 presents the results and some robustness tests, while Section 6 concludes the paper.

2 COVID-19 in Germany: January 2020-May 2021

Our empirical strategy builds on the marked differences in the level of diffusion of the COVID-19 virus in Germany between March 2020 and May 2021. In this section, we briefly recall the development of the pandemic crisis in Germany during this time span. Figure 1 presents the daily trends of the two main indicators: number of new cases and number of deaths.

First wave The first case of COVID-19 infection was reported on the 27th of January 2020 in Bavaria. However, the infection did not spread significantly until March 2020. On the 8th of March, the first death due to COVID-19 was reported and on the 10th of March Coronavirus infections were reported in all the 16 German federal states. As the COVID-19-related cases and deaths were rising, the authorities started to implement restriction measures such as travel bans, school, restaurants, and cinema closures and quarantine measures. To sustain the economy, the federal government launched a relief program worth 156 billion euros. During this first wave the number of cases reached a peak at an infection rate of 44.7 reported infections per 100,000 inhabitants on the 4th of April 2020. The infection rate then fell again until it dropped to under 10 on the 3rd of May. The death rates rose and fell relatively similar to the infection rates and reached its peak in the first wave on the 18th of April with a death rate of 236 (on a 7-day average). Overall, the first wave of COVID-19 in Germany was relatively mild compared with other countries such as Italy, France, or England. Indeed, Germany reported a low number of cases and deaths (Stang et al., 2020).

Second wave From May to mid-August the daily infection rates were relatively low and constantly below 10 infections per 100,000 inhabitants, whereas between mid-August and the beginning of October the infection rates started picking up but stayed below 20 daily infections per 100,000 inhabitants. In October, there was a sharp increase in infection rates all over Germany with infections quickly increasing. Infection rates rose from 17 to 154 daily infections per 100,000 inhabitants in a month. The second wave reached its peak on December the 21st with a daily infection rate of 211.2, the highest daily infection rate in Germany until today. Infection rates dropped until the middle of February to a daily infection rate of 60.9. Also, the COVID-19-related deaths rose sharply with the second wave. The death rate peaked at 889 daily deaths on a 7-day average. The death rate then sharply fell until April. To halt the spread of the virus, the authorities were forced to implement a "light lockdown" on November 2, 2020. However, the restrictive measures had to be reinforced at the end of November since the cases kept growing. Contrary to what happened in the first wave, in the second wave Germany was hit strongly

by the pandemic and the spread of the virus varied substantially from region to region within Germany (Schuppert et al., 2021).

Third wave Between February and April 2021 infection rates started rising again and peaked on April the 22nd 2021 with 177 daily infections per 100,000 inhabitants. Infection rates then dropped to around 70 infections per 100,000 at the end of May. Partly also due to vaccinations, the death rate remained relatively low and stagnated around 200 deaths per day (7-day average). On the 23rd of April 2021 a new federal epidemic law went into place. According to this new law, in every district where the 7-days-incidence is above 100 for three days there are social contact restrictions and a curfew from 10 pm to 5 am. The new law also allows for relaxations in districts where the infection rate stays stable under 100.

3 Data description

Our analysis builds on original survey data collected on a sample of the adult German population at three different stages of the pandemic crisis.[1] Quota sampling has been used to achieve the representativeness of the sample in terms of age, gender, and education levels.[2] The survey has been conducted online and it has been administered by the survey firm Kantar. As shown in Figure 1, the first wave of our survey has been collected in the second half of May 2020; the second wave has been collected at the beginning of November 2020, while the third wave has been collected in the first part of May 2021. Hence, our survey allows us to have data on people's redistributive preferences soon after the end of the first wave, at the beginning of the second wave and at the end of the third wave.

The original sample (interviewed in the first wave) is composed of 3,258 individuals. Of those, 2,482 participated in the second wave, 2,248 participated in the third wave, and 2,029 participated in all three waves. After cleaning the data for missing data in our variables of interest or important controls, the number of individuals in our final sample is 1,645 for the balanced panel and 2,266 for the unbalanced panel.

COVID-19 data. To understand the effect of the severity of the pandemic on preferences for redistribution, we match our survey data with data on the number of COVID-19 cases in Germany provided by the Robert Koch Institute (RKI). To measure the incidence of the pandemic, we use

[1] For more information on the survey "Living in Exceptional Circumstances," see https://www.exc.uni-konstanz.de/en/inequality/research/covid-19-and-inequality-surveys-program/

[2] All the descriptive statistics are reported in Table 1.

the log of the cases and deaths per every 100,000 inhabitants. We match individual data with counties (landkreis) level data on the average number of cases and deaths during the last 7, 14, 28 and 90 days prior to the day of the interview.

To give a better idea of the temporal variation in the severity of the crisis that we are using in the paper, Figure 2 shows the average number of new cases per day during the field period of the three survey waves. We can see that, while almost all counties had an increase in the severity of the health crisis between our first and second wave, a more heterogeneous picture comes from comparing the second to the third wave.

Preferences for redistribution. We build our measure of preferences for redistribution using answers to the following question: "It is the role of the state to reduce the income gap between high-income people and those on low incomes." Individuals might agree or disagree with this statement on a 1-7 scale, where 1 corresponds to totally disagree and 7 to totally agree.

This measure is very similar to those used in the literature. For example, Giuliano and Spilimbergo (2014) use answers to the following question: "Some people think that the government in Washington should do everything to improve the standard of living of all poor Americans. Other people think it is not the government's responsibility, and that each person should take care of himself. Where are you placing yourself in this scale?" Analogous questions have been used in other studies to measure preferences for redistribution (Alesina et al., 2018; Guiso et al., 2006; Roth and Wohlfart, 2018) and are part of the core module in international surveys such as the European Social Survey. On average, around 34% of our respondents disagree to some extent, 20% neither agree nor disagree, and around 46% agree with the statement.

Other variables. Among additional variables that might influence people's redistributive preferences and attitudes, we first consider possible changes in the employment situation. The survey asks individuals whether their employment situation changed due to the pandemic. Possible changes are a decrease/increase in working hours, a worsening of the business condition (only asked to self-employed individuals), the beginning of a compulsory leave, paid or unpaid, and the occurrence of income losses due to the pandemic (only asked to employed individuals). From this information we build a dummy variable equal to 1 if the individual has incurred any possible change that might result in a loss of income and 0 otherwise. Around 15% of our sample experienced an income and/or job loss due to the pandemic.

We also consider the possible impact of the pandemic on preferences for redistribution through individuals health or the health of friends or family members. To this goal, we include a set of

dummy variables to capture the subjective health status and a variable that indicates whether the respondent is considered at risk of COVID-19 severe effects due to pre-existing conditions or whether they know someone who is. More than half of our respondents report good or very good health, around 38% of the sample declare to belong to the corona risk group while only 16% declare not to know anyone belonging to that group.

Finally, to explore some possible mechanisms behind the impact of the pandemic on preference for redistribution, we have also collected data on *inequality aversion*, *interpersonal trust* and *trust in institutions*. To measure inequality aversion, we use the answers to the following statement: "Consider the total income, after taxes, earned by all persons in Germany as a cake with 10 pieces. How many pieces of cake SHOULD ideally be distributed to the 20% of population which earn the most and the 20% of population which earn the least? Answers are on a 0-10 scale where 0 corresponds to 'nothing' and 10 corresponds to 'the whole cake'. The median value for the richest 20% is 4, while for the poorest 20% it is 5 with a standard deviation of 2.2 and 2.6, respectively. In the first wave we have also asked the respondents how many pieces of cake they thought those two groups were currently having (the median are 7 and 2, respectively). These numbers are clearly suggesting that our respondents -on average- tend to overestimate both shares and have difficulties taking into account that there is another 60% of the population in between the rich and the poor. Anyhow, given that in our preferred specification our identifying variation comes from changes within individuals, possible cognitive differences across individuals in answering these questions are taken care of. Moreover, using the data from the first wave, we can also see that on average our respondents perceive the society as more unequal than they would want it to be, thinking on average that the richest 20% should get 34% less of what they think they are currently getting, while the poorest 20% should get 125% more, giving us confidence that within individuals' those two variables are a good proxy for individuals normative views on inequality.

We measure interpersonal trust through answers to the following statement: "Would you generally say that you can trust most people or that you can't be careful enough when dealing with people?" Answers on this question are on a 0-10 scale with 0 corresponding to 'You can't be careful enough' and 10 corresponding to 'You can trust most people.' This question, developed by Rosenberg (1956), is commonly used to measure trust (Algan et al., 2016; Borghi et al., 2020; Daniele and Geys, 2015; Thöni et al., 2012) and is part of the core modules of international surveys such as the World Values Survey or the European Social Survey. The level of trust in our sample is surprisingly low. On the 11-point scale, the average level of interpersonal trust is around 4.

Last, we measure trust in institutions through answers to the following statement: "A number of public institutions and institutions are mentioned here. Please tell us how much trust you have

in the respective institution in the current crisis situation." Answers are on a 1-7 scale where 1 corresponds to 'no trust at all' and 7 to 'very high level of trust.' We focus in particular on those institutions which are normally responsible for the implementation of redistributive policies, i.e. federal and state governments and the federal parliament. The majority of the respondents trust the federal government, more than 30% reporting a high or very high level of trust, a similar picture is true for the state government and the federal parliament with an average higher trust in the former.[3]

4 Identification strategy

Our aim is to identify the causal effect (if any) of a collective shock, such as the COVID-19 pandemic on preferences for redistribution. To uncover the causal relationship, we exploit the heterogeneous diffusion of COVID-19 over time and across regions that is plausibly exogenous to individual behavior.

The main estimation is the following ordinary least squares model (OLS) with individual fixed effect:

$$Y_{i,t} = \alpha + \beta Cases_{i,c,t} + \lambda X_{i,t} + \gamma_i + \varepsilon_{i,t} \tag{1}$$

where $Y_{i,t}$ is the dependent variable, that is the preferred level of redistribution[4] for individual i at time t, $Cases_{i,c,t}$ is the logarithm of the average number of COVID-19-related cases in the 14 days prior to the interview for the individual i in county c, $X_{i,t}$ is a set of variables controlling for potentially confounding factors such as changes in the employment situation due to the pandemic crisis, marital status, health status and possibly belonging to health risk groups. Finally, γ_i is the individual fixed effect, and $\varepsilon_{i,t}$ is the idiosyncratic error term. Estimated standard errors are robust to heteroskedasticity. The random and unexpected increase of COVID-19 cases helps us to identify the causal nexus between the COVID-19 pandemic and preferences for redistribution. Furthermore, the inclusion of the individual fixed effect crucially helps us to get rid of all the time invariant characteristics that could have biased our results such as personality traits or individual ability.

With respect to the meaning of the variable $Cases$, it is worth noting that its causal effect refers not only to the number of cases *per se*, but also to all those aspects that are related to the number of cases and difficult to measure and/or highly correlated, such as lockdown measures,

[3] The correlations between those variables is very high, with a range between 0.8 and 0.9.

[4] See the previous section for the description of the dependent variable.

psychological anxiety and insecurity, social distancing, recovery measures and so on. Therefore, the interpretation of the coefficient should be broader than the mere effect of an increase of a 1% of COVID-19-related cases. Overall, the variable is a broad proxy for the pandemic-related issues, which is most intuitively measured by the number of newly infected during the period under consideration.

5 Results

In this section, we present and discuss our main results. Table 2 shows the effect of the COVID-19 infection on preferences for redistribution. We present different specifications for our results. In the first column there is a simple correlation between the COVID-19 infection and preferences for redistribution. We then add individual controls (column 2) and individual fixed effects using both unbalanced (column 3) and balanced (column 4) panels. We find a negative and significant effect of the COVID-19 infection on preferences for redistribution.

More precisely, in our preferred specification a 1% increase in COVID-19 cases decreases support for redistribution by about 2 percentage points, that is 0.5% of the sample mean and 1.1% of the standard deviation. The difference in redistributive preference we find in our sample between the low and the highly educated individuals is around 23 percentage points on average, while the average difference in redistributive preferences for individuals belonging to the left and to the right of the political scale is of 72 percentage points. Our effect is around 9% and 2.7% of those effects, respectively. If we consider that, given the exponential growth and diffusion of the virus, the real average experienced growth in the severity of the pandemic is way bigger than a 1% increase, in fact as high on average as 85% increase, the total effect of the pandemic on preferences for redistribution is closer to the difference in redistributive preferences we see among political extremes.

This strong negative impact could be at a first glance seen as a puzzling one. Theoretically, one could have expected that a shock that affects individuals without distinction based on their effort or deservingness would increase the support for redistribution, both from a societal point of view, because it can be seen as a fair compensation for undeserved differences, and from an individual perspective, because redistributive policies can be seen as an insurance mechanism given the higher likelihood of being exposed to a loss oneself. Our findings instead seem to suggest that other mechanisms could be in place, such as, for example, an increase in fear and worries, which might bring about more individualism, or a decrease in trust in the system who has not yet managed to put an end to the pandemic, which might reduce the willingness to

support any policy that the same system is in charge of.

Most likely, all these mechanisms are somehow at play and what we see is the results of a combination of those. To shed more light into the possible channels behind this negative impact of the pandemic on redistributive preferences, in the following subsection we present some additional evidence from our survey.

Since being able to control for individual fixed effects is a great advantage of the survey we use, in the remainder of the paper we only show and comment on results from both balanced and unbalanced panels. Indeed, while the former allows us to track the effect over all periods, the latter has a larger sample size. However, the results are qualitatively similar in most of the models, showing that attrition bias is not a relevant issue in the present analysis.

5.1 Possible Mechanisms

Inequality aversion. A health crisis like the one we have been experiencing due to the COVID-19 pandemic may have affected people's normative views about inequality, changing, for example, individuals' beliefs over the reasons behind the income gaps between the rich and the poor. If the pandemic has shifted the share of inequality that people believe comes from bad luck instead of a lack of effort, we should see a shift also in inequality aversion.

We investigate this channel by regressing our measure of inequality aversion, introduced at the end of section 3, on COVID-19 infections. Results are presented in Table 3. In line with the theoretical argument introduced above, we find that an increase in COVID-19 cases leads people to think that less wealth should be allocated to the top 20% and more wealth to the bottom 20%, showing an increase in their inequality aversion.

These results seem at odds with our results on preferences for redistribution and might suggest that inequality aversion and preferences for redistribution do not necessarily go hand in hand.

Economic losses. Another possible channel through which the pandemic can affect preference for redistribution is a more unmediated one. If the severity of the pandemic directly negatively impacts individuals' incomes, we can expect this to be reflected in a shift in support for redistribution. In our survey, we have a question asking whether the respondent suffered economic losses caused by the pandemic crisis. This question is asked only to employed workers, so our sample is almost halved, however it can help us to understand the relation between preferences for redistribution and COVID-19 related economic losses. Our results are presented in Table 4. As expected, the more severe the pandemics the more likely individuals are to also have directly

experienced an income loss. In turn, on average, individuals who had experienced a direct income shock are more in favor of redistribution, but they do not react differently to the collective shock brought by the pandemic.

Interpersonal Trust. Research is showing that the COVID-19 pandemic might decrease interpersonal trust (Brück et al., 2020). Since the literature has established a nexus between generalized trust and support for the welfare state (Algan et al., 2016; Daniele and Geys, 2015), it may be that part of the negative effect between the intensity of the pandemic and preferences for redistribution is due to a decrease in interpersonal trust. We investigate this possible channel by regressing our measure of interpersonal trust on the intensity of the COVID-19 pandemic. Results in Table 5 show that an increase in the intensity of the pandemic has no significant effects on interpersonal trust in our sample. This evidence appears to rule out the possibility that our main results are driven by a decrease in interpersonal trust.

Trust in political institutions. A possible explanation to our puzzling results might be the fact that the pandemic, while increasing both the need for compensation and the aversion for inequality, has decreased the level of trust in the same institutions that are in charge of redistributive policies. The literature has shown that lack of trust in institutions might decrease the support for redistribution (Algan et al., 2011; Daniele et al., 2020). Furthermore, Kuziemko et al. (2015) show that views about inequality do not necessarily have an impact on policy preferences, partly because of the low level of institutional trust that people might have.

To show if this is a plausible explanation in our context, we look at the impact of the intensity of the pandemic on trust in the different political institutions described in section 3. The results displayed in Table 6 show that COVID-19 has an effect on institutional trust. The worsening of the pandemic decreased trust in the Federal government by about 13 percentage points, that represents about 3.2% of the mean. Furthermore, we find evidence that an increase in COVID-19 cases also decreases trust in the Parliament and in the State government by a similar amount.

These results suggest that the decrease in support for redistribution is not driven by an increase in the acceptance of income difference, as, if anything, we have shown an increase in inequality aversion, nor by a lack of reaction to direct income shocks, but could be partly due to a general decrease in trust towards political institutions.

5.2 Robustness checks

To ensure that our results are not sensitive to the choice of the measure of COVID-19 severity used, we test for alternative measures. First, we use the number of deaths in the last 14 days. Secondly, because the choice of analyzing 14 days before the date of interview is arbitrary, we replicate the analysis using a time span of 0, 7, 28, and 90 days. Table 7 shows that results are unchanged if we use these alternative measure and time spans. This may reinforce the assumption made in Section 4 that the measure we use captures the perceived severity of COVID-19 spread in the society and the results do not depend on the specific measure.

6 Conclusions

Our work sheds light on how collective negative shocks affect preferences for redistribution. Specifically, we draw on the county-level heterogeneous spread of the COVID-19 pandemic in Germany to understand how an increase in its intensity influences people's preferences for redistribution. The empirical strategy allows us to control for both time variant and time invariant individual characteristics, so as to uncover a causal relationship between exogenous adverse shocks and preferences for redistribution.

We show that an increase in the intensity of the pandemic leads to a decrease in the support for income redistribution. We test different channels that might explain our findings. We investigate whether the COVID-19 crisis affects people's normative views on inequality and we find that an increase in the intensity of the pandemic increases inequality aversion. Consistent with standard economic theory, we also find that those who incurred economic losses are more likely to support redistribution, while we do not find any effect of the pandemic on interpersonal trust.

A possible explanation of our results is that people's lower support for redistribution is (at least partly) due to a decrease in institutional trust. We show indeed that an increase in the intensity of the current pandemic decreases the level of trust in the central government, the federal government, and in the parliament. The lack of trust towards the institutions in charge of the redistributive policies might represent a reason why people are at the same time less supportive of redistribution and more averse to inequality (Kuziemko et al., 2015).

Previous research has investigated how adverse shocks such as earthquakes or the COVID-19 crisis might affect peoples' support for redistribution, however the drivers behind this relationship are unclear (Cappelen et al., 2021; Daniele et al., 2020; Gualtieri et al., 2019). Our work builds on past research so to provide a comprehensive picture of the mechanisms that might affect the

relationship between negative shocks and preferences for redistribution. Our findings seem to suggest that, when confronted with such unexpected events, people's aversion to inequality and redistributive preferences do not necessarily go hand in hand.

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Tables and Figures

Figure 1: COVID-19 and interviews dates

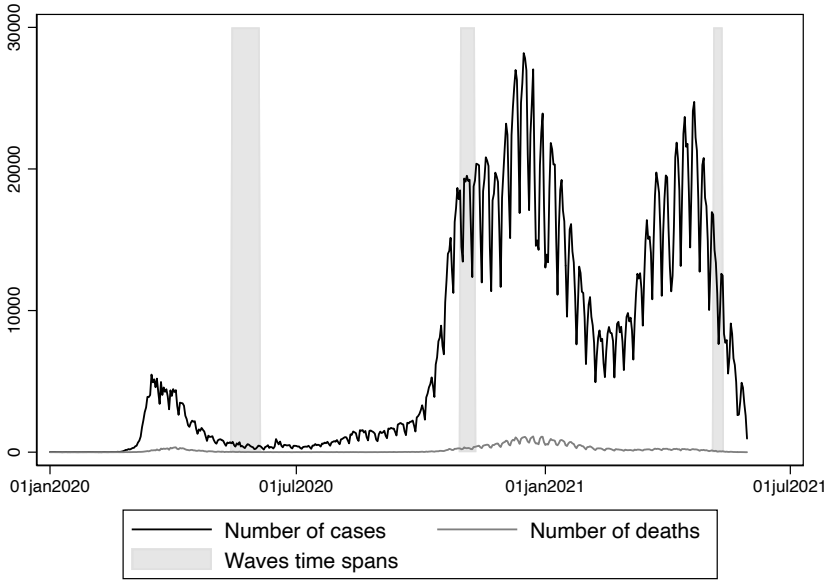

Figure 2: Average number of cases per 100,000 inhabitants over each survey field period.

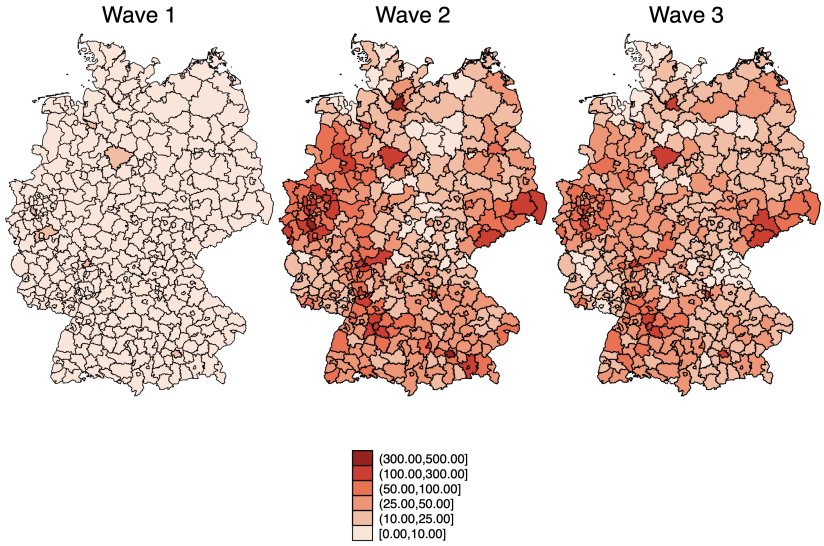

Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Demographics					
Male	0.495	0.5	0	1	6176
Age	50.933	15.75	18	92	6176
Married	0.514	0.5	0	1	6176
Have Children	0.621	0.485	0	1	6176
Tertiary Education	0.343	0.475	0	1	6176
Very good or good Health	0.527	0.499	0	1	6176
Employment Situation					
Changed (worsen)	0.147	0.354	0	1	6176
Covid-19					
Belong Corona Risk Group	0.366	0.482	0	1	6176
Know someone in Risk Group	0.829	0.376	0	1	6176
Deaths / 100000 inhabitants (log) (last 14 days)	2.158	0.589	0	2.691	6176
Infected / 100000 inhabitants (log) (last 14 days)	4.837	1.959	0	7.339	6176
Political and Social Preferences					
Interpersonal Trust	4.18	2.53	0	10	6176
Redistribution	4.263	1.802	1	7	6176
Pie Rich	3.497	2.218	0	10	6176
Pie Poor	5.035	2.598	0	10	6176
Trust Fed. Gov.	4.077	1.807	1	7	6176
Trust Fed. Parliament	3.915	1.7	1	7	6176
Trust State Gov.	4.105	1.755	1	7	6176

Table 2: Preference for redistribution

	OLS	OLS	FE unbalanced	FE balanced
Infected (last 14 days)	-0.029***	-0.023**	-0.018*	-0.022**
	(0.011)	(0.011)	(0.009)	(0.010)
Individual controls	No	Yes	Yes	Yes
Observations	7137	7035	6176	4934
Individuals			2266	1645
R2	0.001	0.056	0.006	0.008

Note: Robust standard errors in parentheses. Controls are: gender, age and education groups, partnership/marital status, parental status, health and employment status. * p<0.1, ** p<0.05, *** p<0.01.

Table 3: Inequality Aversion

	FE unbalanced		FE balanced	
	Pie Rich	Pie Poor	Pie Rich	Pie Poor
Infected (last 14 days)	-0.275***	0.102***	-0.273***	0.102***
	(0.013)	(0.014)	(0.015)	(0.015)
Individual controls	Yes	Yes	Yes	Yes
Observations	6176	6176	4934	4934
Individuals	2266	2266	1645	1645
R2	0.111	0.018	0.108	0.017

Note: individual fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 4: Income Losses

	FE unbalanced		FE balanced	
	Economic losses	Redistribution	Economic losses	Redistribution
Infected (last 14 days)	0.001**	-0.029*	0.001*	-0.034**
	(0.000)	(0.015)	(0.000)	(0.017)
Economic Losses	.	0.738**	.	0.784**
	.	(0.322)	.	(0.365)
Economic losses × Infected (last 14 days)	.	-0.005	.	-0.010
	.	(0.030)	.	(0.034)
Constant	0.006	4.704***	0.009	4.836***
	(0.012)	(0.314)	(0.014)	(0.364)
Observations	3126	3126	2446	2446
Individuals	1266	1266	896	896
R2	0.975	0.014	0.980	0.017

Note: individual fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 5: Interpersonal Trust

	Can Trust Most (unbalanced)	Can Trust Most (balanced)
Infected (last 14 days)	0.018	0.020
	(0.012)	(0.013)
Individual controls	Yes	Yes
Observations	6176	4934
Individuals	2266	1645
R2	0.011	0.013

Note: individual fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 6: Institutional Trust

	FE unbalanced			FE balanced		
	Fed. Gov.	Fed. Parliament	State Gov.	Fed. Gov.	Fed. Parliament	State Gov.
Infected (last 14 days)	-0.124***	-0.094***	-0.095***	-0.136***	-0.104***	-0.108***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6176	6176	6176	4934	4934	4934
Individuals	2266	2266	2266	1645	1645	1645
R2	0.083	0.055	0.051	0.094	0.063	0.064

Note: individual fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 7: Robustness

	Redistribution	Redistribution	Redistribution	Redistribution	Redistribution
Deaths (last 14 days)	-0.069*	.	.	.	.
	(0.036)	.	.	.	.
Infected (daily)	.	-0.025*	.	.	.
	.	(0.013)	.	.	.
Infected (last 7 days)	.	.	-0.021**	.	.
	.	.	(0.010)	.	.
Infected (last 28 days)	.	.	.	-0.026**	.
	.	.	.	(0.012)	.
Infected (last 90 days)	.	.	.	.	-0.038*
	.	.	.	.	(0.020)
Individual controls	Yes	Yes	Yes	Yes	Yes
Observations	4934	4934	4934	4934	4934
Individuals	1645	1645	1645	1645	1645
R2	0.008	0.008	0.008	0.008	0.008

Note: individual fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.