

Public support for global vaccine sharing in the COVID-19 pandemic¹

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Abstract: As of early November 2021 40% of the global population was recorded as fully vaccinated but the global distribution of vaccines is extremely unequal, with over 80% vaccinated in the top 10 countries and below 1% in the bottom 10. Per capita GDP alone explains about 60% of the variation in vaccination rates; Covid mortality only 6%. We combine evidence from three experiments to assess how much German citizens support public contributions to global vaccination campaigns, and what drives that support. We find that German respondents are supportive of substantive funding amounts, on the order of the most generous contributions provided to date, though still below amounts that are likely needed for a successful global campaign. Their motivations are in part explained by strategic considerations but appear to primarily stem from concerns over the well being of global populations. Strategic concerns relating to the contributions of other countries appear not to be important in shaping public opinion on the matter. The provision of information on global needs has a significant impact on support for contributions as evidenced from both attitudinal and behavioral measures.

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Introduction

As of early November 2021 40% of the global population is recorded as fully vaccinated but the global distribution of vaccines is extremely unequal, with over 80% vaccinated in the top 10 and below 1% in the bottom 10. Per capita GDP alone explains about 60% of the variation in vaccination rates; Covid mortality about 6%.

Besides the evident inequities and the economic and health threats to poorer countries, the risks from weak rollout include economic and health threats to wealthier countries, arising from continued interruptions of global supply chains, and the preservation of reservoirs that facilitate disease mutation. Thus vaccine inequity is not only a humanitarian disaster, but it also makes it impossible to reach global herd immunity to sustainably stop the spread of the virus. It has been estimated that approximately 70% of the worldwide population must be fully vaccinated to end the COVID-19 pandemic (Randolph and Barreiro, 2020). The delta variant has pushed the threshold for global herd immunity to 80% and potentially approaching 90%, according to the Infectious Diseases Society of America.²

Researchers at the IMF estimate the benefits of global vaccination at \$9 trillion and the costs at \$50 billion (Agarwal and Gopinath, 2021). Other estimates put costs closer to €80 billion. Though there is no clear determination of what a fair share is, as a benchmark, if the richest 25% of countries provided €Euro per citizen this would sum to 80 billion Euros and imply contributions of about €6 billion for Germany and 23 billion for the United States. Using the Fair Share calculation, based on OECD guidelines, Germany's share of OECD donor shares would be \$5bn (8% of \$63bn).³

Of course cash is not the only way to meet needs. In addition countries can help provide vaccines directly, or provide support, including by extending intellectual property rights and knowhow. Direct donation of vaccines is limited by supply however and sets up a starker distributional challenge. Indeed allocations are currently being administered to provide third vaccinations—booster shots—in wealthy countries, before first vaccinations are given

²Source: <https://fortune.com/2021/08/04/delta-variant-herd-immunity-higher-threshold/>

³For details see Action and Hamilton (2021).

in poorer ones (Mahase, 2021). Hence, vaccines against COVID-19 will continue to be scarce and poorer countries will struggle obtaining sufficient vaccines for their citizens in the foreseeable future. On 4 August 2021, WHO director Tedros Adhanom Ghebreyesus therefore called for a moratorium halting COVID-19 vaccine boosters in favor of unvaccinated.⁴

Given that governments need to secure public support either for making large transfers or for sharing vaccines with poorer countries, it is important to understand the levels and drivers of public support for vaccine sharing.

While previous research has focused on mapping the international distribution of COVID-19 vaccines (CITATIONS), little is known about public preferences for global vaccine sharing. Building on previous work on European solidarity during the Eurozone crisis (Bechtel, Hainmueller and Margalit, 2017; Kuhn, Nicoli and Vandenbroucke, 2020; Kuhn, Solaz and van Elsas, 2018; Stoeckel and Kuhn, 2018) and preferences for international climate agreements (Bechtel, Genovese and Scheve, 2019; Bechtel, Hainmueller and Margalit, 2017; Bechtel and Scheve, 2013), we assess the extent to which popular preferences for global vaccine sharing are based on a cost-benefit calculation and shaped by the specific costs and benefits for the donor country and the participation of other countries. We also assess the extent to which public support can be increased through information campaigns appealing to the self-interest of citizens.

Combining evidence from a conjoint experiment and a video treatment administered in Germany we find that German respondents are supportive of funding relatively large amounts, though not amounts sufficient to fund global efforts, if generalized. Their motivations are in part explained by strategic considerations but appear to primarily stem from concerns over the well being of global populations. While there is a preference for multilateral efforts, support for large contributions is not dependent on this.

The results of our study have implications for the current public debate on global vaccine distribution, but also for international solidarity and international cooperation more generally. On the one hand, the COVID-19 vaccination is a highly salient issue for all citizens worldwide

⁴Source: <https://www.reuters.com/business/healthcare-pharmaceuticals/who-calls-moratorium-covid-19-vaccine-booster>

which provides a unique opportunity to study popular preferences for globally sharing scarce goods. On the other hand, since herd immunity is a global public good as the pandemic can only be overcome if all countries worldwide are immunized, our findings can furthermore inform the literature on preferences for international cooperation.

Design

We draw from data generated from three experiments as part of a multiwave study of vaccine attitudes implemented by the authors in Germany in 2021. We employ data from wave 2, fielded with 13,782 citizens in Germany from 29 April to 10 May 2021 and wave 4, fielded with 10,525 s from 8 until 22 September 2021 (for details, see the 32 Supporting Information (SI)). Our population of interest consists of all German citizens between 18 and 75. We rely on a representative sample which was drawn with the help of the online-access panel provider Respondi. All analyses were specified in a preregistered analysis plan made available at the Center for Open Science (<https://osf.io/69mpy>) and the study obtained IRB approval at Humboldt-Universität zu Berlin.

Experiment 1. Our primary measurement of attitudes to sharing draws on a conjoint experiment implemented in wave 4. In the experiment, participants were asked to consider two situations, and give feedback on how much Germany should contribute to global efforts, in and in kind. The situations varied on four dimensions.

Two types of variation focused on the returns to Germany of a successful global campaign. One asked participants to imagine that "The risk of new mutations of the coronavirus increases considerably in Germany if there are no vaccinations in poorer countries"; a second asked participants to imagine that "The German economy shrinks by around 5% if there are no vaccinations in poorer countries." For each of these a control condition was provided in which there were no costs to Germany if there are no vaccinations in poorer countries.

The other two variations focused on the nature of multilateral agreements, asking participants to imagine settings in which 0, 20 or 40 countries took part, contributing collectively €0, €20,

or €40 billion.⁵

In secondary analyses we examine drivers of support for deals and the scope to alter support through information provision.

Experiment 2. To assess drivers for support for international deals, wave 2 respondents took part in a Conjoint experiment in which they compared two hypothetical multilateral proposals for vaccine sharing. Respondents were asked to indicate which proposal they would prefer and to rate each proposal with regard to how likely they would vote in favor of or against it in a referendum. We randomize the following dimensions: contribution to global vaccine sharing, contribution to global vaccine sharing relative to other countries, number of countries participating in global vaccine sharing, economic benefits and health benefits. The factors were assigned with independent probabilities. Each respondent received three vignettes successively. However, respondents did not see that same profile twice.

Experiment 3. To assess the scope for encouraging support, wave 2 participants took part in an information experiment in which participants were randomly assigned to a *treatment group* that is exposed to a video explaining the benefits of global vaccine sharing and a *control group* which did not see a video. Subsequently respondents were questioned whether they support the international distribution of vaccines (attitudinal outcome) and were offered the opportunity to donate money to UNICEF which was put in charge for global vaccine sharing (behavioural outcome). More specifically, respondents earned 75 so-called "Mingle Points" cents for their participation in the survey which corresponds to 0,75 Euros. We offered them 50 additional Mingle Points and gave them the following choice. They could either keep the 50 Mingle Points for themselves or donate all or part of them to UNICEF for the worldwide distribution of corona vaccines. For every point they donated, we donated 1.5 Euro Mingle points to UNICEF (see table 2 in the Supplementary Materials). Experiment 3 was implemented before Experiment 2, allowing us to examine the impact of the treatment on outcomes in Experiment 2 (as well as on Experiment 1).

Before all experiments, we collected a number of covariates that to examine to what extent

⁵In practice this is implemented as a $2 \times 2 \times 5$ factorial design because there are only 5 types of deal since 0 participants implies 0 contributions and vice versa.

international vaccine solidarity is moderated by individual attitudes and attributes. We included trust in government and local health system (Mesch & Schwirian, 2015), economic hardship and education (Bertoncello et al., 2020), minority group status and maternal age (Danis et al., 2010), risk perception (Brewer et al., 2007) and health status (Guay et al., 2019). Additionally, we collect data on political attitudes, attitudes towards migrants, and attitudes towards COVID-19 as well as indicators that identify groups who are eligible for the vaccine.⁶

Results

Experiment 1.

Figure 1 shows the share of Germans supporting contributions of €x or less (top panel) or x donations or less, given a situation in which there are no expected health or economic benefits for Germany (blue line) or large costs (red line); and in which there is no international deal cited (blue line) or a large deal cited (red line).

We see that median contributions are around €2 billion which is almost exactly in line with current commitments (source). About one third support commitments around €5 bn. A small share—around 1 in 8, support much larger contributions.

We can see here that both sets of conditions increase the shares supporting deals, though the effects are quantitatively small.

Figure 2 shows the marginal effects of all conditions on optimal cash donations and doses.

Experiment 2. Figure 3 reports the results of the treaty experiment. The results are largely in line with our theoretical expectations.

The first result is somewhat inconsistent with findings so far: the number of vaccine doses that Germany would distribute to other countries negatively affects solidarity. Thus, citizens are more willing to share a smaller number of vaccine doses with other countries. In other words, international solidarity among citizens decreases with the absolute costs of distribution.

⁶Please see the questionnaire in the Supplementary Materials for more details.

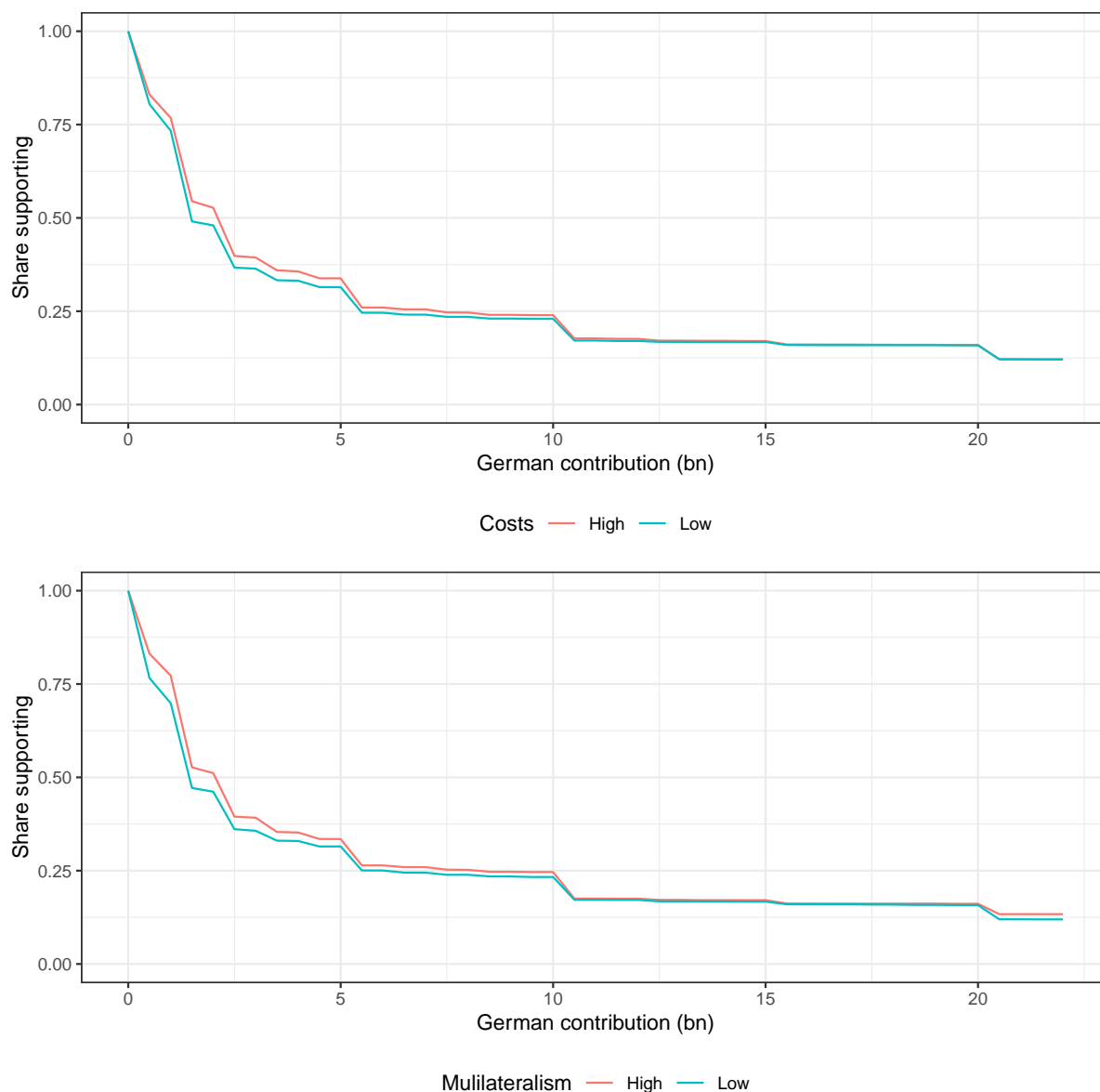


Figure 1: Distribution of support for contributions of different sizes

Other results are largely in line with expectations. We find that it matters for citizens how much other countries are contributing to global vaccine redistribution. Solidarity among citizens is lowest when Germany contributes 20 per cent of all the vaccine doses that are globally shared, but it increases with other countries contributing a higher share to global vaccine sharing. In a similar fashion, we also find that the number of countries that participate in global vaccine sharing positively influences solidarity. Citizens are more willing to donate vaccine doses to poorer countries when more countries participate in global redistribution. With regard to the risk of infection, we show that citizens are more willing to share vaccine

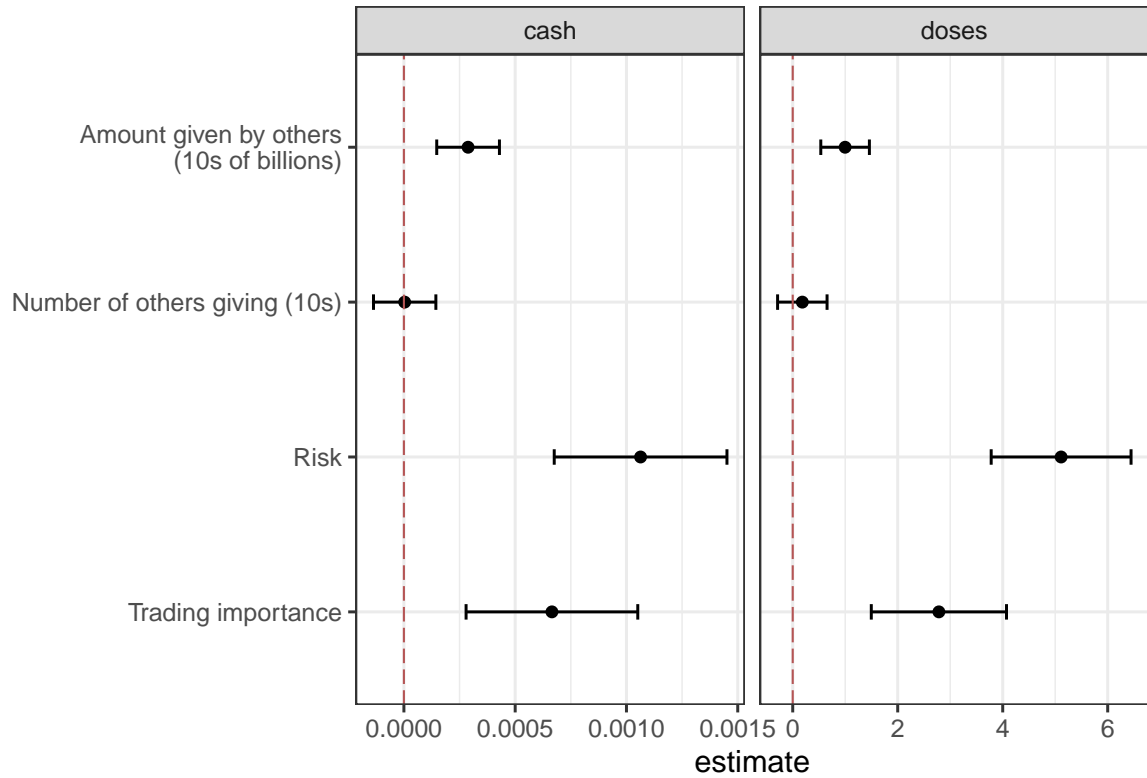


Figure 2: Results of Experiment 1

doses with poorer countries if these countries constitute a health risk for Germany (e.g. popular tourist destinations or countries with which Germany has strong economic ties). Thus, respondents were more willing to donate vaccine doses to minimize the risk of infections for Germany.

While all these findings are in line with our theoretical expectations, the result for economic importance is counterintuitive. While we expected that the economic importance of a country for Germany should increase the willingness of citizens to share vaccine doses, we find the opposite effect here. The less important a country is to Germany economically, the more willing are citizens to redistribute vaccine doses. Hence, while all the other findings speak for a cost-benefit calculation that fundamentally drive international solidarity among citizens, this finding instead suggests that also the neediness of a country could account for the level of solidarity among citizens.

Experiment 3. Figure 4 reports the findings of the randomized intervention. We find that respondents in the treatment group which were exposed to the video are significantly more

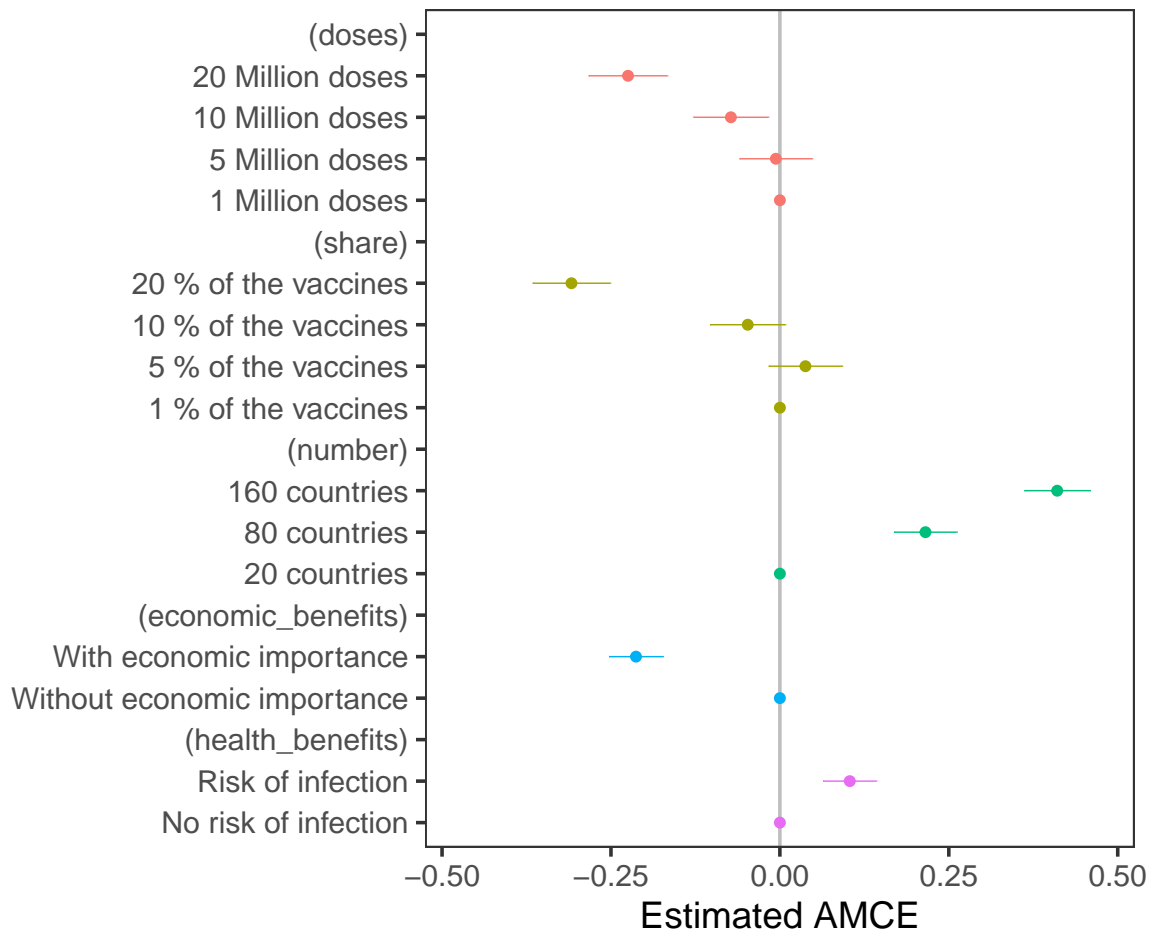


Figure 3: Results of Experiment 2

likely to show solidarity both with regard to the attitudinal and the behavioural outcome. More specifically, the willingness to personally support international distribution of vaccines is 0.069 units higher than in the control group. In a similar vein, the donations that respondents made to UNICEF were on average significantly higher in the treatment than in the control group.

A final analysis examines how Experiment 3 alters the results on support for agreements assessed in Experiment 2. Table 1 gives the main results. We see clear evidence for the impact of the video on assessment of agreements. First we see that the video made respondents less likely to support ungenerous agreements (with low contributions, few donors, and small shares). Second the video greatly mitigates, but does not overcome, the aversion to larger contributions. It greatly augments the desire to see more donors. Finally there is weak evidence that it weakens the strategic gains from health outcomes for Germany.

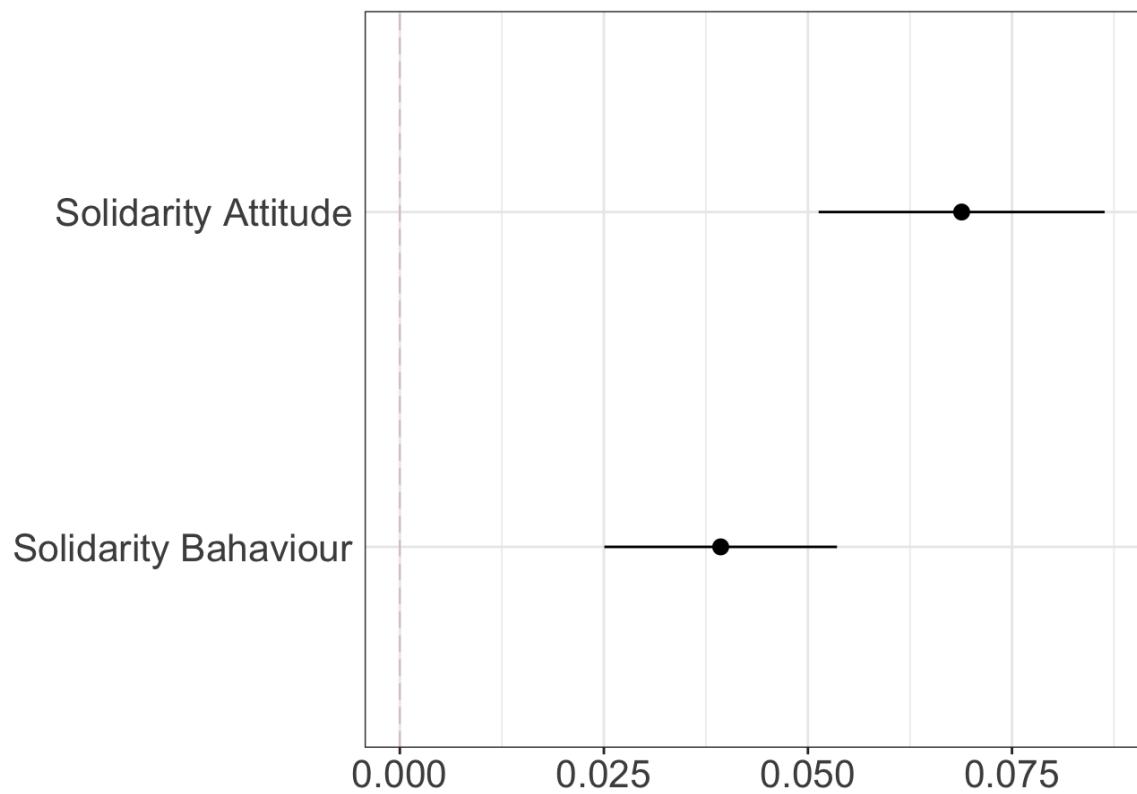


Figure 4: Effect of video treatment on individual solidarity

These treatment effects do not persist to predict outcomes from Experiment 1

	rating	choice
Constant (Average rating)	0.172*** (0.028)	0.529*** (0.007)
Video effect (given ungenerous agreement)	-0.190*** (0.041)	-0.044*** (0.010)
German contribution	-0.101*** (0.009)	-0.030*** (0.002)
German share	-0.097*** (0.009)	-0.022*** (0.002)
Number of donors	0.165*** (0.012)	0.058*** (0.003)
Economic benefits	-0.209*** (0.020)	-0.053*** (0.005)
Health benefits	0.133*** (0.020)	0.036*** (0.005)
Video * Contribution	0.060*** (0.013)	0.020*** (0.003)
Video * Share	0.020 (0.013)	0.002 (0.003)
Video * Donors	0.095*** (0.017)	0.019*** (0.004)
Video * Economics	-0.011 (0.028)	-0.008 (0.007)
Video * Health	-0.048 (0.028)	-0.014* (0.007)
R ²	0.015	0.021
Adj. R ²	0.015	0.021
Num. obs.	82692	82692
RMSE	2.033	0.495

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 1: Effects of treatment on drivers of support for agreements.

1 Conclusions and implications

The numbers supported by the median German citizen, on the order of 2 billion Euros, if

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Supplementary Materials

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A Study Design

- **Introductory text:** And now we come to the topic of the global vaccination campaign. The pandemic can only be defeated if it is brought under control globally. In the fight against Covid-19, the provision of vaccines is particularly important. The COVAX platform was set up under the leadership of the World Health Organization (WHO) for the acquisition and fair distribution of vaccines.

- **Video:** The video can be found here: <https://www.dw.com/de/impfstoff-f%C3%BCr-entwicklungsl%>

A.1 Outcome: Willingness to share

A.2 Outcome: Personal donation

- **Personal donation:** You can also contribute to the global distribution of the vaccines yourself. UNICEF is working on behalf of the COVAX initiative to ensure that the corona vaccines are made available to people in the poorest countries.

Next to the 75 Mingle points that you receive for taking part in this survey, you will receive an **additional 50 Mingle points** from us. You can either keep these points yourself or donate all or part of them to UNICEF for the worldwide distribution of corona vaccines. For every mingle point you donate, we donate 1.5 mingle points to UNICEF.

Please select how the additional Mingle points should be allocated to you or UNICEF.

Table 2: Bonuses and donations

1	0 Mingle Points	75 Mingle Points
2	10 Mingle Points	60 Mingle Punkte
3	20 Mingle Points	45 Mingle Points
4	30 Mingle Points	30 Mingle Points
5	40 Mingle Points	15 Mingle Points
6	50 Mingle Points	0 Mingle Points

- *Donations go here:* <https://www.unicef.de/spenden/jetzt-spenden?purpose=235762>

A.3 Conjoint Design

- **Introductory text:** In the following, we present suggestions on how Germany's contribution to the global distribution of vaccine doses to poorer countries could look like this year.
- **Conjoint Design:** Our second outcome measure is a conjoint experiment (two profiles) with randomly assigned factors (uniform) over five attributes. Each respondents will see three pairs. Unit of randomization is respondent pair.

subsectionWave 2 conjoint results

In wave 2 of the survey we implemented a Conjoint experiment in which respondents assessed two hypothetical proposals about Germany's contribution to global vaccine sharing. Respondents were asked to indicate which proposal they would prefer and to rate each proposal with regard to how likely they would vote in favor of or against it in a referendum. The Conjoint experiment allows for estimating the effect of each factor on respondents' preferences for global vaccine sharing. We randomize the following dimensions: contribution to global vaccine sharing, contribution to global vaccine sharing relative to other countries, number of countries participating in global vaccine sharing, economic benefits and health benefits. The factors were assigned with independent probabilities. Each respondent received three vignettes successively. However, respondents did not see that same profile twice.


This design differs from the wave 4 design in two important ways. First whereas in wave 4 outcomes included both contributions and doses; the wave 2 design focused on doses only and included the number of doses as part of the conjoint features. Second the economic and health risk items in the wave 2 conjoint implicitly altered the *set* of countries receiving rather than the conditions under which countries receive. In addition the orders of magnitude are not in line with those facing policy makers.

	Proposal
Sharing of vaccination doses	{0} Germany will give away 1 Million doses of its Covid Vaccine {1} Germany will give away 5 Million doses of its Covid Vaccine {2} Germany will give away 10 Million doses of its Covid Vaccine {3} Germany will give away 20 Million doses of its Covid Vaccine
Germany's contribution compared to other countries	{0} Germany contributes 1% of the vaccines donated worldwide {1} Germany contributes 5% of the vaccines donated worldwide {2} Germany contributes 10% of the vaccines donated worldwide {3} Germany contributes 20% of the vaccines donated worldwide
How many countries share vaccination doses	{0} 160 countries {1} 80 countries {2} 20 countries
Recipient countries - economic benefit	{0} Countries in need with economic importance for Germany {1} Countries in need, even without economic importance for Germany
Recipient countries - risk of infection	{0} Countries in need from which there is a risk of infection for Germany

Proposal
{1} Countries in need even if there is no risk of infection for Germany

A.4 Outcomes:

- **Forced Choice:** *Displayed as bottom row in the conjoint table*
 - Which proposal do you prefer? (*Respondents choose between both displayed options*)
- **Opposition to solidarity:** *The following tables is displayed below the conjoint table*



	Vorschlag 1	Vorschlag 2
Abgabe von Impfdosen	Deutschland gibt 20 Millionen Impfdosen ab	Deutschland gibt 20 Millionen Impfdosen ab
Deutschlands Beitrag im Vergleich zu anderen Staaten	Deutschland trägt 5% der weltweit gespendeten Impfstoffe bei	Deutschland trägt 5% der weltweit gespendeten Impfstoffe bei
Wie viele Staaten geben Impfdosen ab	20 Länder	20 Länder
Empfängerstaaten - wirtschaftlicher Nutzen	Bedürftige Staaten, auch ohne wirtschaftliche Bedeutung für Deutschland	Bedürftige Staaten, auch ohne wirtschaftliche Bedeutung für Deutschland
Empfängerstaaten - Ansteckungsgefahr	Bedürftige Staaten, von denen eine Ansteckungsgefahr für Deutschland ausgeht	Bedürftige Staaten, von denen eine Ansteckungsgefahr für Deutschland ausgeht
Welchen der beiden obigen Vorschläge würden Sie bevorzugen?	<input type="radio"/>	<input type="radio"/>

Ratings

Wenn Sie in einem Referendum über jeden der beiden Vorschläge abstimmen könnten, wie wahrscheinlich ist es, dass Sie für oder gegen die Vorschläge stimmen würden? Bitte geben Sie Ihre Antwort auf einer Skala von "definitiv dagegen" (0) bis "definitiv dafür" (10).

	0 definitiv dagegen	1	2	3	4	5	6	7	8	9	10 definitiv dafür
Vorschlag 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vorschlag 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Figure 5: Conjoint Design

B Descriptive Statistics