Vaccine Nationalism Counterintuitively Erodes Public Trust in Leaders

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Abstract

Global access to resources like vaccines is key for containing the spread of infectious diseases. However, wealthy countries often pursue nationalistic policies, stockpiling doses rather than redistributing them globally. One possible motivation behind vaccine nationalism is a belief among policymakers that citizens will mistrust leaders who prioritize global needs over domestic protection. In seven experiments (total N=4215), we demonstrate that such concerns are misplaced: nationally representative samples across multiple countries with large vaccine surpluses (Australia, Canada, U.K., and U.S.) trusted redistributive leaders more than nationalistic leaders — even the more nationalistic participants. This preference generalized across different diseases, and manifested in both self-reported and behavioral measures of trust. Professional civil servants however had the opposite intuition and predicted higher trust in nationalistic leaders, and a non-expert sample also failed to predict higher trust in redistributive leaders. We discuss how policymakers' inaccurate intuitions might originate from overestimating others' self-interest.

Statement of Relevance

A key factor in pandemic recovery is global access to medical resources. Yet rollout of supplies such as vaccines is characterized by stark inequities: in past and current pandemics, high-income nations have secured large quantities of doses beyond their needs, while low-income countries struggle to provide first doses. Scientific evidence suggests these nationalistic policies have severe economic and virologic consequences, but politicians may hesitate to endorse redistribution for fear that prioritizing global concerns over domestic protection might lose them votes. We investigate trust in nationalistic vs. redistributive leaders in the context of Covid-19 and the H5N1 influenza, and show that citizens prefer redistributive leaders. A sample of civil servants however had the *opposite* intuition, predicting that the public will prefer nationalistic leaders. This discrepancy between public opinion and policymakers' forecasts may result from experts overestimating the public's self-interest, when in fact vaccine equity may be favorable even politically.

The Covid-19 pandemic has highlighted striking inequities between different countries' capacity to respond to the crisis. Access to vaccines exemplifies these dramatic disparities: while 73% of people in high-income countries have been vaccinated, low-income countries remain largely unable to access doses, with vaccination rates as low as 24% at the time of writing (United Nations Development Programme, 2022). Mitigating this inequity is crucial for preventing further harms from the pandemic (Lazarus et al., 2022), since widespread vaccination can help prevent the emergence of new variants with potentially increased transmissibility (Eaton, 2021; Wagner, 2021). However, against scientific evidence on the benefits of vaccine equity, wealthier countries are keeping most available doses for their own citizens ('vaccine nationalism') rather than sending them around the globe where they are most needed ('vaccine redistribution'). As a result, a few nations amounting to 13% of the global population have secured about 50% of all available doses, including unnecessary 'surplus' doses — with some nations reserving up to 9 doses per person (Mullard, 2020). Such inequities in vaccine distribution are not specific to Covid-19: similar patterns have often emerged in past health crises, from polio and smallpox (Fidler, 2020), to the 2009 H1N1 influenza (Fidler, 2010), and the recent monkeypox outbreak (Taylor, 2022). In fact, some countries have accumulated stockpiles even for potential future pandemics such as the H5N1 influenza (more commonly known as bird flu; Docter-Loeb, 2023).

Why is there such a disconnect between scientific recommendations and public policy? One possible reason for implementing nationalistic policies is a concern among policymakers that prioritizing global over domestic needs might reduce public trust and political support, especially among more nationalistic and conservative citizens (Fidler, 2020; Smith, 2020). Whether this is a valid concern remains an open question. On the one hand, large scale surveys

in high-income countries have shown that people generally prefer allocating vaccines to citizens of their own country before redistributing them to other nations (Nair & Peyton, 2022; Steinert et al., 2022). On the other hand, people are often perceived as more suitable and trustworthy political leaders when they maximize overall welfare, as opposed to prioritizing those closer to them (Everett et al., 2018; Everett, Colombatto, et al., 2021). This suggests that political leaders may be trusted more, rather than less, if they voice support for vaccine redistribution.

Here we test whether endorsing redistributive instead of nationalistic vaccine policies increases public trust in political leaders. We elicited trust in political leaders endorsing either redistribution or nationalism in a series of pre-registered experiments with nationally representative samples[1] across four countries with high vaccine surpluses (Australia, Canada, the United Kingdom, and the United States; Study 1), as well as a probability sample of U.S. residents (Study 2). In parallel, we measured policymakers' intuitions about public trust in leaders who endorse nationalistic vs. redistributive vaccine policies. We seized a unique opportunity to survey a sample of professional civil servants from across the globe, including policy analysts and advisors working in the public sector at the local, state, or national level. These civil servants were incentivized to accurately forecast public trust in leaders endorsing vaccine redistribution vs. nationalism (Study 3). In addition, we obtained these same forecasts from a nationally representative sample of U.S. residents (Study 4). This set of studies allows us to measure actual trust in redistributive vs. nationalistic leaders from multiple representative samples (Studies 1-2), and to contrast these results with the intuitions of samples of experts

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[1] Unless otherwise noted, samples are described as 'nationally representative' in terms of age and gender.

(Study 3) and non-experts (Study 4). Finally, we demonstrate the generalizability of our findings

across policy wordings (Study 5), infectious diseases (Study 6), and measures of trust (Study 7).

Study 1: Trust in Redistributive vs. Nationalistic Leaders

We recruited nationally representative samples from four countries with high vaccine

surpluses (Australia, Canada, United Kingdom, and United States). Participants read our vaccine

redistribution dilemma, and were then told about a hypothetical leader who was endorsing either

a redistribution or a nationalistic policy (in a between-subjects design). They then reported their

trust in the leader — both in their overall character, and in their advice on other issues. We

chose to examine trust in hypothetical rather than real politicians in order to isolate the effect of

policy endorsement from other confounding characteristics such as familiarity or political

orientation.

Method

All studies reported here were pre-registered, were approved by the Yale University

Institutional Review Board (Protocol #2000027892), and were conducted in February-April 2022

(Studies 1-4) or March-April 2023 (Studies 5-7). Pre-registrations, materials, data, and analysis

code for all studies are openly available on the Open Science Framework (OSF) website at this

link: https://osf.io/q6ej4/.

Participants

Nationally representative participants were recruited through Prolific Academic

(Prolific.co) from Australia, Canada, U.K., and U.S. Based on estimates of effect sizes from

pilot data, we recruited 2000 participants (500 participants in each country). Participants were

excluded according to our pre-registered exclusion criteria if they (1) took the survey more than

once (N=46); (2) failed one or both attention checks at the beginning of the experiment requiring

them to recall instructions and information from the previous page (N=245; for full text, see

materials on the OSF repository); (3) reported living in a different country than that of intended

recruitment (N=2); or (4) failed a comprehension check for the trust question (N=101). No

participants failed to answer more than 50% of the questions. Of 2044 participants who took

part in the study, a total of 1650 participants were thus included in the analyses (N_{women}=868;

M_{age}=41.62).

Procedure

        After completing two attention checks, participants were introduced to our vaccine

redistribution dilemma with a short description of the issue ("While the

[Australian/Canadian/U.K./U.S.] government currently has a large excess of doses, many other

countries are dealing with severe shortages of vaccines"), followed by two potential policies:

redistribution ("Some are arguing that the vaccines should be sent wherever they can achieve the

greatest good, even if that means sending them to other countries") and nationalism ("Others are

arguing that the vaccines should be kept in [Australia/Canada/the U.K./the U.S.] to protect

[Australian/Canadian/British/American] citizens"). Note that the dilemma was tailored to each

participant's own country (e.g., Australian participants read about the Australian government;

full text of all experimental materials is available on the OSF repository).

        Participants then reported their own policy preferences ("Which policy do you think

should be adopted?", where 1="Strongly support surplus [Australian/Canadian/U.K./U.S.]-

bought vaccines being reserved for protecting [Australian/Canadian/British/American] citizens",

4="Indifferent", and 7="Strongly support surplus [Australian/Canadian/U.K./U.S.]-bought

vaccines being given to whoever needs them most, even if that means sending them to other

countries"). In addition, they reported their moral judgments regarding the redistribution policy (not analyzed in the current manuscript).

Participants were then told about the preference of a political leader endorsing either redistribution or nationalism (in a between-subjects design).

Redistributive Leader

'Imagine that the mayor of a major city in your region is arguing that surplus [Australian/Canadian/U.K./U.S.]-bought vaccines should be given to whoever needs them most.

This mayor said, "We should be impartial in distributing our surplus vaccines and send them where they can achieve the greatest good, even if that means sending them to other countries."'

Nationalistic Leader

'Imagine that the mayor of a major city in your region is arguing that surplus [Australian/Canadian/U.K./U.S.]-bought vaccines should be reserved for protecting [Australian/Canadian/British/American] citizens.

This mayor said, "We have a duty to reserve our surplus vaccines as a backup to protect the people in our own country, before we start helping other nations."'

They then rated their trust both in the leaders' overall character ("How trustworthy do you think this person is?", where 1="Not at all trustworthy", 4="Somewhat trustworthy", and 7="Extremely trustworthy") and in their advice on unrelated issues ("How likely would you be to trust this person's advice on other issues?", where 1="Not at all likely", 4="Somewhat likely", and 7="Extremely likely"), and were then tested on their comprehension of these questions.

Finally, participants answered some questions regarding their concerns for the health and economic consequences of the pandemic, their attitudes towards the safety and effectiveness of Covid-19 vaccines, their own vaccination status, their attitudes towards the governments' response to Covid-19, and their nationalistic tendencies — both in general (e.g., "For the most part, [Australia/Canada/the U.K./the U.S.] is better than any other country in the world."), and regarding vaccines more specifically (e.g., "[Australia/Canada/The U.K./The U.S.] should fund

manufacturing facilities in developing countries to expand global vaccine supply."). They also

answered a binary question about their vaccine nationalism tendencies ("Thinking about

developing countries around the world, which statement comes closer to your view about

COVID-19 vaccines, even if neither is exactly right?", where 1="[Australia/Canada/The

U.K./The U.S.] should ensure that there are enough vaccines for people in [Australia/Canada/the

U.K./the U.S.], even if it means people in developing countries need to wait longer to get

vaccines", 2="[Australia/Canada/The U.K./The U.S.] should help ensure that people in

developing countries have access to vaccines, even if it means some people in

[Australia/Canada/the U.K./the U.S.] need to wait longer to get vaccines", with these two options

displayed in a randomized order; Funk & Tyson, 2021; Nair & Peyton, 2022). They also

completed the Social Desirability Scale (Fischer & Fick, 1993) and the Oxford Utilitarianism

Scale (Kahane et al., 2018), as well as a question related to their political orientation ("In

political matters, people talk of 'the left' and 'the right.' How would you place your views on

this scale, generally speaking?" where 1="Left" and 7="Right") and other demographics

(namely gender, age, race, country of residence, education, subjective socioeconomic status

[SES], religiosity, past participation in Covid-related studies). For full text, see materials on the

OSF repository.

Results

Figure 1 depicts the effect of vaccine policy endorsement on trust in leaders in Study 1.

As detailed in our pre-registered analysis plan, to examine participants' trust in the leaders we

conducted a linear mixed-effects model predicting the composite measure of trust (i.e. the

average of the two trust questions), with leader (Redistributive vs. Nationalistic), demographic

variables (namely gender, age, race, education, subjective SES, political ideology, and

religiosity), and policy support as fixed effects, and country as random intercept. Because this model yielded a singular fit, we report the results of a simpler model without the random intercept (as specified in our pre-registered plan). As shown in Figure 1a, leaders who endorsed vaccine redistribution were trusted more than those who endorsed vaccine nationalism (B=1.54, SE=0.06, t=24.70, p<.001, CI=[1.42, 1.66]; mean trust for redistribution leader=5.02 on the 1-7 scale, SE=0.10 vs. nationalism leader=3.48, SE=0.10).

To ensure that these results did not originate from any particular characteristic of participants who passed our exclusion criteria, we ran as an exploratory analysis this same model on the full sample, after applying exclusions criteria 1 and 3 only (repeated participation and different country; valid N=1996). The results were unaltered: leaders who endorsed vaccine redistribution were trusted more than those who endorsed vaccine nationalism (B=1.48, SE=0.06, t=25.89, p<.001, CI=[1.37, 1.59]).

Next, we examined the consistency of this effect across countries as an exploratory analysis via a linear model predicting the composite measure of trust (i.e. the average of the two trust questions), with leader (Redistributive vs. Nationalistic), country, and their interaction as fixed effects. The preference for nationalistic leaders was indeed consistent across all four countries surveyed (Figure 1b; all interactions B<0.19, p>.281).

To examine the robustness of this effect across participants' demographic characteristics such as education, politics, and religion, we ran a linear model without covariates, i.e. predicting the composite measure of trust with leader as the sole fixed effect. The effect in this simpler model was unchanged (B=1.54, SE=0.06, t=24.60, p<.001, CI=[1.41, 1.66]). In addition, we conducted a series of exploratory independent samples t-tests comparing trust in redistributive vs. nationalistic leaders in subsets of (1) nationalistic participants (as indicated by their response

to a binary vaccine nationalism question; see Procedure); and (2) conservative participants (i.e., those who answered "Right" when asked about their political orientation; see Procedure). Strikingly, even participants who personally endorsed vaccine nationalism did not trust the nationalistic leader more than the redistributive leader (higher trust in redistributive leader, $t(735)=6.27$, $p<.001$, $d=0.46$, CI=[0.31, 0.60], Figure 1c), and neither did the most politically conservative participants ($t(47)=0.21$, $p=.836$, $d=0.06$, CI=[-0.50, 0.62]).

Finally, we ran an exploratory analysis of participants' own policy preferences via a one-sample Wilcoxon signed-rank test against indifference (i.e., the middle of the scale, 4, labeled "Indifferent"). Personal policy preferences revealed that most participants personally endorsed redistribution (mean policy support=5.43, median=6, SD=1.63, range=1-7, where 1=support nationalism, and 7=support redistribution; one-sample Wilcoxon signed-rank test against indifference: V=1003610, $p<.001$, $r=0.65$, CI=[0.61, 0.68]).

Study 2: Replication in a U.S. Probability Sample

To ensure the replicability and generalizability of the findings of Study 1, we next conducted a replication in a sample of U.S. citizens. Because one of the most striking aspects of the findings of Study 1 was their robustness across participants' demographic characteristics, we chose to recruit a probability sample of the U.S. population, rather than a convenience sample from a crowdsourcing platform marketplace as in Study 1. This new sample was thus representative of the U.S. population in terms of age and gender (as in Study 1), but also other factors such as education and political orientation — allowing us to test the replicability, but also generalizability of the results of Study 1.

Method

A U.S. probability sample of 700 participants was recruited through YouGov, a panel of 2 million registered users selected to match a random sample of the U.S. population in terms of a variety of factors including age, race, gender, education, marital status, number of children under 18, family income, employment status, citizenship, state, metropolitan area, voter registration, voter turnout, religion, interest in politics, party identification, and ideology. Participants in the current study were recruited from this larger pool by stratifying by age, race, gender, education, and voter registration, and by simple random sampling within strata. This sample size was chosen to match the sample size from each country in Study 1, accounting for exclusions.

Participants were excluded according to our pre-registered exclusion criteria if they (1) failed one or both attention checks at the beginning of the experiment (N=247); or (2) failed a comprehension check for the trust question (N=56). Two additional participants were recruited but immediately screened out because they did not agree to the consent form. A total of 395 participants were thus included in the analyses (N_{women}=204; M_{age}=54.37).

The procedure for Study 2 was identical to Study 1.

Results

As detailed in our pre-registered plan, the analytic plan for Study 2 was identical to Study 1, except that because participants were recruited from the U.S. only, we no longer included country as a random intercept in the analyses. To examine participants' self-reported trust in the leaders, we thus conducted a linear model predicting the composite measure of trust, with leader, demographics, and policy support as fixed effects. As shown in Figure 1d, leaders who endorsed vaccine redistribution were trusted more than those who endorsed vaccine nationalism (B=1.26, SE=0.16, t=8.06, p<.001, CI=[0.95, 1.56]; mean trust for redistribution leader=4.07, SE=0.32 vs.

nationalistic leader=2.82, SE=0.32). This effect also held in the full sample prior to our pre-registered exclusions (N=698; *B*=0.98, SE=0.12, *t*=8.16, *p*<.001, CI=[0.75, 1.22]), and was consistent across participants' demographic characteristics such as education, politics, and religion (*B* in a model without covariates=1.28, SE=0.16, *t*=8.25, *p*<.001, CI=[0.98, 1.59]).

Personal policy preferences again revealed that most participants personally endorsed redistribution (mean=5.06, median=6, SD=1.89, range=1-7; one-sample Wilcoxon signed-rank test: V=42946, *p*<.001, *r*=0.49, CI=[0.40, 0.56]). However, even participants who personally endorsed vaccine nationalism did not trust the nationalistic leader more than the redistributive leader (*t*(212)=0.70, *p*=.488, *d*=0.09, CI=[-0.17, 0.36]), and neither did the most politically conservative participants (*t*(57)=-1.54, *p*=.129, *d*=-0.40, CI=[-0.91, 0.12]).

Study 3: Expert Forecasts of Public Trust

The results of Study 1 and 2 demonstrate that at least in the intermediate stages of Covid-19 (March 2022), endorsement of vaccine redistribution enhances public trust in leaders. But can experts correctly forecast this effect? To find out, we recruited a unique sample of civil servants (including policy analysts and advisors), and incentivized them to predict the results of Studies 1-2.

Method

Participants

A sample of 261 anonymous civil servants was recruited during a webinar hosted by Apolitical, an online network and learning platform for government that connects hundreds of thousands of civil servants and policymakers in 160 countries. Participants were excluded according to our pre-registered exclusion criteria if they reported having heard of the study

before (N=70). A total of 191 participants were thus included in the analyses (N_{women}=131; M_{age}=42.69).

The majority of civil servants reported being from Canada (N=80 or 42%) and the United Kingdom (N=67 or 35%), followed by the Philippines (N=13 or 7%), South Africa (N=5 or 3%), Bangladesh (N=4 or 2%), and the United States (N=3 or 2%). Most completed an undergraduate degree (N=73 or 38%) or an advanced postgraduate degree (N=72 or 38%), and there was a normal distribution across the political spectrum (mean=3.14, median=3, SD=1.31, range=1-7, where 1="left" and 7="right"). Most reported working in the public sector (N=179 or 94%; non-profit organization=7 or 4%; academia=2 or 1%; self-employed=1 or 1%). The most common occupations were civil servant, analyst or policy analyst, advisor, policy advisor or senior policy advisor, project manager, administrative assistant, and researcher. Participants worked in close contact to different degrees with both politicians (mean=40.34, median=41.50, SD=32.49, range=0-100, where 0="no contact at all" and 100="very close contact"), and citizens (mean=51.43, median=54.50, SD=32.97, range=0-100, where 0="no contact at all" and 100="very close contact").

Procedure

At the beginning of the survey, participants were told that we had recently run a study about trust in leaders in "representative samples from four countries (Australia, Canada, United Kingdom, and United States)", and that their job would be to guess the results of that study. Next, they were introduced to the vaccine redistribution dilemma and potential policies with the same description as in Studies 1-2 (see Study 1 Procedure). They were then told that the other participants "were asked to imagine that the mayor of a major city in their region is arguing for one of the following policies", followed by the leader statements (see Study 1 Procedure), shown

in a randomized order. Next, they were asked: "On average, which leader do you think other participants trusted more?" — to be answered with one of three options: the leader endorsing redistribution and the leader endorsing nationalism ("Leader 1" and "Leader 2", depending on the randomized assignment), and neither ("Leader 1 and Leader 2 were trusted equally"). They were also asked to guess others' policy preferences ("Which policy do you think most participants [...] thought should be adopted?", to be answered on a scale 1-7, where 1="Most people strongly support surplus vaccines being reserved for protecting citizens in the home country", 4="Most people are indifferent", and 7="Most people strongly support surplus vaccines being given to whoever needs them most, even if that means sending them to other countries"). These two forecasts were displayed in a random order, and were both followed by a question regarding participants' confidence in their predictions. To encourage accuracy, participants were informed that three respondents would be randomly selected amongst those who answered correctly for a $100 gift card — with the option of donating the amount to charity if they so wished.

Finally, they reported their own opinions regarding which policy should be adopted, and answered some questions regarding their concerns for the health and economic consequences of the pandemic, as well as some questions regarding their demographics (namely gender, age, residence, education, political orientation, job descriptions, past participation in similar studies).

Results

As detailed in our pre-registered plan, to examine participants' predictions about which leader would be trusted more, we conducted a Chi-square goodness of fit test on the observed proportions of the three choices (redistribution, nationalism, neither), with expected frequencies of 33% each. This analysis revealed that professional civil servants made the *opposite* prediction

of what we actually found in Studies 1-2: the majority (55%) predicted that the nationalistic leader would be trusted more, while only 27% predicted that the redistributive leader would be trusted more (overall $\chi^2(2)=45.06$, $p<.001$, $w=0.49$). A follow-up pairwise comparison of choices for redistributive vs. nationalistic leaders confirmed a significant difference between the two ($\chi^2(1)=18.46$, $p<.001$, $w=0.34$; Figure 2a).

As for Studies 1-2, we ran an exploratory analysis of participants' own policy preferences via a one-sample Wilcoxon signed-rank test against indifference (i.e., the middle of the scale, 4, labeled "Indifferent"). Strikingly, the majority of these experts predicted that the public would favor the nationalistic leader despite reporting a personal preference for vaccine redistribution (mean policy support=6.05, median=7, SD=1.60, range=1-7; one-sample Wilcoxon signed-rank test V=14582, $p<.001$, $r=0.77$, CI=[0.70, 0.83]).

Study 4: Non-Expert Forecasts of Public Trust

Civil servants in Study 3 were strikingly unable to correctly forecast the impact of vaccine policy endorsement on public trust. In a separate experiment, we asked whether such miscalibration is specific to policy experts, or whether the general public would also mispredict public opinion.

Method

A nationally representative sample of 300 U.S. participants was recruited through Prolific Academic (Prolific.co). This sample size was chosen to match that of Study 3, and rounded up to help achieve representativeness. Participants were excluded according to our pre-registered exclusion criteria if they reported having heard of the study before (N=34). All participants reported living in the United States. Of 304 participants who took part in the study, a total of

270 participants were thus retained after exclusions and included in the analyses (N_{women}=142; M_{age}=44.16).

The majority of participants reported having started or completed an undergraduate degree (N=82 or 30%, and N=102 or 38%, respectively), and there was a normal distribution across the political spectrum (mean=3.24, median=3, SD=1.75, range=1-7, where 1="left" and 7="right"). Most reported working in a company or for-profit business (N=102 or 38%; unemployed=77 or 29%; non-profit organization=13 or 5%, academia=13 or 5%, public sector=20 or 7%, self-employed=45 or 17%). The most common occupations were retired, student, analyst, teacher, accountant, or IT. Participants did not work in close contact with politicians (mean=8.30, median=0, SD=17.82, range=0-92, where 0="no contact at all" and 100="very close contact"), and they worked with citizens to different degrees (mean=55.33, median=65.50, SD=37.69, range=0-100, where 0="no contact at all" and 100="very close contact").

The procedure for Study 4 was identical to Study 3.

Results

The analyses for Study 4 were identical to Study 3. Overall, participants had no clear prediction about whether the redistributive or nationalistic leader would be trusted more (44% and 38%, respectively; overall $\chi^2(2)$=31.20, *p*<.001, *w*=0.34; redistributive vs. nationalistic leader $\chi^2(1)$=1.46, *p*=.227, *w*=0.08; Figure 2b). The forecasts were thus equally split among leaders, although again participants reported a personal preference for redistribution (mean policy support=5.39, median=6, SD=1.81, range=1-7; one-sample Wilcoxon signed-rank test V=22262, *p*<.001, *r*=0.60, CI=[0.51, 0.68]).

Non-expert forecasters in Study 4 were thus unable to predict the results of Studies 1-2, and civil servants in Study 3 made the downright opposite prediction. A Chi-square test of independence on the three choice options confirmed that these prediction patterns differed significantly from each other ($\chi^2(2)=16.69$, $p<.001$, $w=0.19$), and follow-up pairwise comparisons further revealed that professional civil servants in Study 3 selected the nationalistic leader more often than U.S. residents in Study 4 ($\chi^2(1)=15.81$, $p<.001$, $w=0.20$).

Finally, as an exploratory analysis, we compared the distributions of policy preferences across Studies 1 through 4 via a Kruskal-Wallis one-way ANOVA on ranks, and followed up on significant differences via pairwise Mann-Whitney tests with Bonferroni correction. Forecasters in Studies 3 and 4 indeed differed in their personal policy endorsement: while the majority of participants across Studies 1-4 preferred vaccine redistribution over nationalism, there was a main effect of policy preference (Kruskal-Wallis $H(3)=60.73$, $p<.001$), such that civil servants in Study 3 endorsed vaccine redistribution more than non-expert samples in Studies 1, 2, and 4 (all ps$<.001$), while non-experts in Study 4 endorsed vaccine redistribution just as much as those in Study 1 ($p=1.000$) and Study 2 ($p=.079$). In sum, civil servants in Study 3 inaccurately predicted that the public would prefer leaders endorsing nationalistic policies, despite themselves having an even stronger personal preference for redistributive policies.

Study 5: Statistical Information

Studies 1 and 2 demonstrate a strong preference for leaders supporting redistributive policies, but using vague information that could be perceived as biasing. In a new experiment, we assess the robustness of this result by using more neutral materials featuring objective and statistical information, and describing the "surplus" more concretely with the exact amount of

accumulated doses as reported by the International Monetary Fund and World Health

Organization.

Method

Participants

We recruited a U.S. nationally representative sample of 300 participants. The sample

size for this and the following studies was chosen as the minimum to achieve representativeness,

and we confirmed via a power analysis of data from U.S. participants in Study 1 that it would be

sufficient to achieve 95% power to detect the effect of leader argument on self-reported trust.

Participants were excluded if they: (1) took the survey more than once (N=2); (2) failed one or

both attention checks at the beginning of the experiment (N=22); (3) failed a comprehension

check for the trust question (N=27). No participants reported living in a country other than the

U.S. or failed to answer more than 50% of the questions. Of 303 participants who took part in

the study, a total of 252 were thus included in the analyses (N_{women}=135; M_{age}=46.75).

Procedure

Participants read the vaccine redistribution dilemma with statistical information. For

example, in previous experiments participants were introduced to hoarding as "more than enough

to provide first doses and boosters for everyone in the country"; this vague (and potentially

leading) statement was then replaced with the more objective "securing 3.97 times the number of

doses required to fully vaccinate each person", with these details taken from the IMF-WHO

COVID-19 Vaccine Tracker. The potential policies were also more neutrally worded: the

redistribution policy was previously described as "arguing that the vaccines should be sent

wherever they can achieve the greatest good, even if that means sending them to other

countries," where the "greatest good" might have been leading; this policy was thus replaced

with more neutral wording ("arguing that the doses should be sent to countries where there are

shortages"). Similarly, the statement of the redistributive leader contained some potentially

biasing language ("vaccines should be given to whoever needs them most"), which was now

replaced with more neutral phrasing ("vaccines should be redistributed to countries where there

are shortages"). The study was otherwise identical to Study 1; for full text, see materials on the

OSF repository.

Results

As detailed in our pre-registration, the analytic plan for Study 5 was identical to Study 1,

except that because participants were recruited from the U.S. only, we no longer included

country as a random intercept. To examine participants' self-reported trust in the leaders, we

thus conducted a linear model predicting the composite measure of trust, with leader,

demographics, and policy support as fixed effects. As shown in Figure 3a, leaders who endorsed

vaccine redistribution were trusted more than those who endorsed vaccine nationalism (B=1.64,

SE=0.17, t=9.37, p<.001, CI=[1.30, 1.98]; mean trust for redistribution leader=4.12, SE=0.49 vs.

nationalistic leader=2.48, SE=0.48). Notably, even participants who personally endorsed

vaccine nationalism did not trust the nationalistic leader more than the redistributive leader

(higher trust in redistributive leader, t(135)=3.77, p<.001, d=0.64, CI=[0.29, 0.98]), and neither

did the most politically conservative participants (t(11)=-0.48, p=.641, d=-0.26, CI=[-1.32,

0.81]). Overall, these results suggest that the preferences for redistributive leaders we

documented in Studies 1 and 2 are not artifacts of our experimental design, but also arise with

new materials using more neutral and objective information.

Study 6: Avian Influenza

Investigations of public perceptions in the context of Covid-19 are of obvious timely relevance, but the current pandemic is by no means the only context in which issues of vaccine equity arise. For example, high-income nations such as the U.S. and the U.K. have already stockpiled vaccines for H5N1, a strain of avian influenza that has so far mostly only affected birds and poultry but has more recently also reached mammals (Anthes, 2023) and might soon pose a more serious threat to humans (Mahase, 2023; Tufekci, 2023). To assess whether our results generalize to other diseases, we also ran a version of Study 5 replacing Covid-19 with H5N1.

Method

Participants

We recruited a U.S. nationally representative sample of 300 participants, and excluded according to our pre-registered criteria those who: (1) failed one or both attention checks at the beginning of the experiment (N=34); (2) failed a comprehension check for the trust question (N=15). No participants took the survey more than once, reported living in a country other than the U.S., or failed to answer more than 50% of the questions. Of 301 participants who took part in the study, a total of 252 were thus included in the analyses (N_{women}=128; M_{age}=46.44).

Procedure

Participants read an introduction to H5N1 and recent developments that make it a potential health threat. They were asked to imagine that "the U.S. government ends up having hundreds of millions of H5N1 vaccine doses – more than the number of doses required to fully vaccinate each person [while] some countries do not have enough doses to fully vaccinate their

entire population", followed by the same potential policies and leader statements as in Study 5.

The study was otherwise identical to Study 5; for full text, see materials on the OSF repository.

Results

As in Study 5, we conducted a linear model predicting the composite measure of trust,

with leader, demographics, and policy support as fixed effects. As shown in Figure 3b, even in

the context of H5N1 leaders who endorsed vaccine redistribution were trusted more than those

who endorsed vaccine nationalism (B=0.92, SE=0.19, t=4.92, p<.001, CI=[0.55, 1.29]; mean

trust for redistribution leader=3.86, SE=0.31 vs. nationalistic leader=2.93, SE=0.33). Again,

even participants who personally endorsed vaccine nationalism did not trust the nationalistic

leader more than the redistributive leader (higher trust in redistributive leader, t(170)=1.97,

p=.051, d=0.30, CI=[0.00, 0.60]), and neither did the most politically conservative participants

(t(14)=-1.27, p=.224, d=-0.64, CI=[-1.63, 0.38]). Overall, these results were thus similar to

Studies 1, 2, and 5, suggesting that preferences for redistributive leaders are not idiosyncratic to

Covid-19, but can arise even in the context of other diseases.

Study 7: An Incentivized Election

While the studies reported so far demonstrate a robust preference for redistributive

leaders, they were elicited in relatively inconsequential scenarios with hypothetical leaders. In a

new study, we explore preferences for redistributive leaders in a more ecologically valid task

with behavioral incentives. Here, participants were invited to cast a vote for an actual leader

who would be responsible for making a charitable donation on behalf of a group, with the

possibility of embezzling some of the money for themselves (Everett, Colombatto, et al., 2021) –

a resource management scenario commonly encountered by leaders, especially in times of crisis.

<u>Method</u>

<u>Participants</u>

We recruited a U.S. nationally representative sample of 300 participants, and excluded according to our pre-registered criteria those who: (1) took the survey more than once (N=2); (2) failed one or both attention checks at the beginning of the experiment (N=38); (3) failed a comprehension check regarding what the leader would be able to do with the donation (N=26). No participants reported living in a country other than the U.S. or failed to answer more than 50% of the questions. Of 302 participants who took part in the study, a total of 236 were thus included in the analyses (N_{women}=124; M_{age}=46.74).

<u>Procedure</u>

After reading the introduction to the vaccine dilemma, participants ('voters') were invited to "make a choice that has real financial consequences", namely to "vote for a leader to be responsible for [a] group's donations". This donation was determined via a separate study run a few days earlier, where a separate group of participants ('donors', N=100) were given a $2.00 bonus each, and had the opportunity to donate some of it to the United Nations Children's Fund (UNICEF). In total, donors chose to contribute a total of $65.63, and received the remaining $134.37 as bonuses.

Voters were told that the elected leader would be able to manage this donation, with two options: they could either "transfer the group's $65.63 donation to UNICEF in full", or "take some of this money for themselves (up to the full amount) and transfer whatever amount is left to UNICEF." On a separate page, voters were then asked to vote for one of two people: one supporting the redistribution policy, and the other the nationalistic policy (with these options

being displayed in a counterbalanced order). After casting their vote, participants completed

demographic questions as in Study 5; for full text, see materials on the OSF repository.

At the end of the study, we tallied up voters' preferences and determined the outcome of

the election (i.e., whether they preferred a redistributive or nationalistic leader). Next, we

randomly selected one of the donors from the earlier study whose policy preference matched the

election results, as assessed via a forced choice question ("Thinking about possible vaccine

distribution policies, which of these two positions comes closer to your views about COVID-19

vaccine distribution?"). In this first study, donors were also asked about their preferences

regarding the group donation should they be elected ("If you are selected to be responsible for

the group's donations, what percentage of the total donations do you want to keep as an

additional bonus?"). We thus implemented the choice of the elected leader by allocating the

group donation to UNICEF and to the elected donor according to their preferred percentages.

Results

As detailed in our pre-registration, to examine participants' voting behavior, we

conducted a binomial test on the observed proportions of the two leaders (redistribution,

nationalism), with expected frequencies of 50% each. As shown in Figure 3c, the vast majority

of voters (84%) voted for the redistribution leader ($p<.001$, CI=[79, 89%]). Again, even

participants who personally endorsed vaccine nationalism did not vote for the nationalistic leader

more than for the redistributive leader (votes for redistributive leader: 74%, $p<.001$, CI=[66,

81%]), and neither did the most politically conservative participants (60%, $p=.607$, CI=[32,

84%]). Overall, these results demonstrate that preferences for redistributive leaders are robust to

variations in the elicitation method and survive the introduction of real financial incentives.

General Discussion

Containing global health crises requires equitable access to vaccines across the world, but in both past and current pandemics such efforts have been undermined by nationalistic policies wherein wealthier countries accumulate large quantities of surplus doses for their own citizens. Policymakers may support the implementation of such policies in part because they believe that vaccine redistribution will reduce trust and political support, especially among nationalistic and conservative voters. Here we demonstrate otherwise: in nationally representative samples across four countries with high vaccine surpluses (Studies 1-2, 5-7), we found that leaders who endorse vaccine redistribution policies are actually trusted more than those who endorse nationalistic policies. Endorsement of vaccine redistribution policies thus enhances trust in political leaders, in line with past work on redistribution of resources like money or medicine (Everett et al., 2018; Everett, Colombatto, et al., 2021).

In fact, participants in these four countries with high vaccine surpluses for the most part personally preferred vaccine redistribution. This result held even for more nationalistic participants – consistent with previous evidence for a disconnect between participant's own preferences in moral dilemmas and what kind of person they trust (Everett et al., 2016; Everett et al., 2018; Everett, Colombatto, et al., 2021). That is, even when participants recognize that a redistributive policy is less beneficial for themselves, they can still trust a person in power who endorses that policy — potentially because this can signal an impartial commitment to the greater good (Crockett et al., 2021).

Importantly, our observation of increased trust in redistributive leaders turned out to be counterintuitive: professional civil servants believed the public would prefer nationalistic leaders (Study 3), while non-experts did not have consistent predictions (Study 4). The inaccuracy of

forecasts in Study 3 was even more striking given that these experts personally preferred redistribution, and did so even more strongly than participants in Studies 1-2.

Of course, our study reflects preferences in a specific time-point, and it remains an open question whether they would hold at other time-points (e.g. during times of greater pandemic threat) or other situations (e.g., crises with wider temporal horizons like famine). However, preferences for redistributive leaders were robust: they arose from even just statistical information (Study 5), replicated in another disease (Study 6), and manifested in an ecologically valid task with real financial outcomes (Study 7). Moreover, these results are consistent with other studies exploring different types of resources and conducted earlier in the pandemic (November-December 2020; Everett, Colombatto, et al., 2021). The current studies add to this past work by showing that policymakers have opposite intuitions, predicting that nationalistic leaders are trusted more.

We also note that while our sample of civil servants provides ecologically valid insights into policymakers' beliefs about public trust in leaders, these were also constrained to a specific time-point, and we cannot draw firm conclusions about the intuitions of policymakers in general. However, the disconnect we observed between actual public opinion and civil servants' intuitions is consistent with past work in other domains demonstrating that social science and policy experts often mispredict public attitudes and behavior (Ben-David et al., 2013; Morgan, 2014; DellaVigna & Pope, 2018; Cohn et al., 2019; Milkman et al., 2022).

We speculate that these miscalibrated forecasts might originate from an overestimation of the public's self-interest: according to the well-documented "myth of self-interest", people tend to believe that others are more selfish than they actually are, and in turn expect them to behave more selfishly than they actually do (Miller & Ratner, 1998; Neumann & Zaki, 2023). This

hypothesis could account for the overestimation of trust in nationalistic leaders in Studies 3-4. In addition, the fact that experts' forecasts in Study 3 were more inaccurate than non-experts' in Study 4 raises the intriguing possibility that overestimation of self-interest might be heightened in civil servants as a result of either experience or self-selection, and that this pessimistic view of the public might affect policymakers' behavior.

      As such, this disconnect reflects a form of pluralistic ignorance (Miller & McFarland, 1991), wherein individuals systematically misperceive public opinion by overestimating how much it differs from their own. Indeed, such misperceptions of public opinions have been shown in other domains such as climate change (Leviston et al., 2013; Sparkman et al., 2022), alcohol consumption (Prentice & Miller, 1993), and political hostility (Moore-Berg et al., 2020; Ruggeri et al., 2021; Brady et al., 2023). Collectively, these results demonstrate that endorsement of redistributive vaccine policies enhances public trust in leaders, and suggest that an accurate understanding of public opinion by policymakers is crucial for the containment and prevention of current and future health crises and resource shortages.

Open Practices Statement

All pre-registrations, materials, data, and analysis code are openly available on the Open Science Framework (OSF) website at this link: https://osf.io/q6ej4/.

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Author Contributions

All authors designed research; C.C. conducted the experiments and analyzed data; C.C. and M.J.C. wrote the paper, with critical revisions from all authors.

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Competing Interests

The authors declare no competing interests.

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Figure Captions

Figure 1. Effect of vaccine policy endorsement on trust in leaders. Self-reported trust (measured on a scale from 1 "Not at all trustworthy" to 7 "Extremely trustworthy") was higher in leaders endorsing vaccine redistribution compared to vaccine nationalism (panel a). This result was consistent across nationally representative samples in four countries with high vaccine surpluses (Study 1; panel b), was robust even in participants who endorsed vaccine nationalism (Study 1; panel c), and replicated in a probability sample of U.S. residents (Study 2; panel d). Boxplots represent mean and 95% confidence intervals.

Figure 2. Forecasts of public trust in leaders endorsing nationalistic versus redistributive vaccine policies, depicted as the percentage of participants who predicted each leader (or neither) would be trusted more. Professional civil servants predicted that the nationalistic leader would be trusted more (panel a), while U.S. residents did not consistently predict higher trust in either leader (panel b). Dotted lines represent chance selections, and error bars represent 95% confidence intervals.

Figure 3. Generalization tests for the effect of vaccine policy endorsement on trust. Leaders were trusted more when they endorsed vaccine redistribution vs. nationalism, both when the surplus was described in general terms (Studies 1-2) and when it was described with statistical information (Study 5; panel a). This effect held for Covid-19 (Studies 1-2), but also for avian influenza (Study 6; panel b). Higher trust manifested in self-report ratings (Studies 1-2), and in incentivized voting tasks (Study 7; panel c).