VACCINE DIPLOMACY: HOW COVID-19 VACCINE DISTRIBUTION IN LATIN AMERICA INCREASES TRUST IN FOREIGN GOVERNMENTS*

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Vaccine distribution in the Global South has created opportunities for vaccine-developing countries to improve their international reputations. Leveraging a panel survey conducted in early 2021, we evaluate whether "vaccine diplomacy" affects trust in foreign governments in six Latin American countries. Among vaccinated respondents, we find that trust in the government of the country that they believed developed their vaccine increased relative to trust in the governments of other foreign powers. Furthermore, providing information about the aggregate distribution of vaccines within a respondent's country increased vaccine-eligible respondents' trust in the governments of countries from which more vaccines were delivered. In each case, greater trust principally reflects updated perceptions of a common good motivation. Our empirical findings suggest that vaccine distribution—especially for China, but for other vaccine-developing countries as well—can cultivate favorable international public opinion. This may in turn facilitate great powers' economic, political, or military foreign policy goals.

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1 Introduction

The rapid development of effective vaccines has mitigated the toll of the COVID-19 pandemic. Initially limited vaccine supplies and government control over when and where vaccines were sent has made "vaccine diplomacy" a novel dimension of geopolitics. The US has transparently stated its goal to use vaccine diplomacy to "reassert US leadership on the world stage ... and to counter efforts by Russia and China to use their own state-funded vaccines to expand their global influence."[1] Likewise, China and Russia have also sought to use their nationally-produced vaccines to their geopolitical strategic advantage. Chinese leader Xi Jinping announced that "China would make domestically developed vaccines a global public good" as part of a "charm offensive" to improve its public image abroad.[2] By June 2022, 1.9 billion doses of Chinese-developed vaccines had made their way around the globe, as had hundreds of millions of doses of Russia's Sputnik V vaccine,[3] over 587 million doses of the US' Johnson & Johnson, Moderna, and Pfizer/BioNTech vaccines,[4] and over 67 million doses of the UK's AstraZeneca vaccine.[5] More generally, as part of heightened competition to win global hearts and minds (Goldsmith, Horiuchi and Wood, 2014), great powers are increasingly engaging in international relations through public health initiatives (Fazal, 2020).

In this article, we assess whether a core aspect of vaccine diplomacy—vaccine distribution—affects citizen trust in the government of the country where vaccines were developed. Such trust facilitates the exercise of both hard and soft power, making it more likely that countries obtain international support for their agendas (e.g. Brewer et al., 2004; Goldsmith and Horiuchi, 2012; Sides and Gross, 2013). Due to its potential to foster international cooperation, alliances, peace, and trade, observers like Mogensen (2015:316) argue that "in the international arena, public trust is a treasure." In the context of citizens' exposure to mass vaccination campaigns, such as during the COVID-19 pandemic, vaccine distribution may be a powerful tool to increase influence over

[1] "U.S. to donate more than 17 million Johnson & Johnson vaccines to the African Union," *CNN*, 10/15/2021.

[2] "From Asia to Africa, China Promotes Its Vaccines to Win Friends," *New York Times*, 9/11/2020. See also Kurlantzick (2007).

[3] China COVID-19 Vaccine Tracker, Bridge Beijing, retrieved on 6/6/2022.

[4] Our World In Data, 6/6/2022.

[5] Our World In Data, 6/6/2022.

foreign public opinion and thus an effective part of the arsenal of statecraft (Goldsmith, Horiuchi and Wood, 2014).[6] We argue that it could do so by enhancing the perception of a foreign power as a public goods provider, at least when this perception overpowers citizens' cynicism about the motives of foreign governments (Rhee, Crabtree and Horiuchi, 2023).

Leveraging an online panel survey of vaccine-eligible individuals conducted before and after mass vaccination campaigns began in six Latin American countries, we evaluate two ways through which citizens encounter vaccine distribution that could affect trust in vaccine-developing countries. First, we exploit within-eligibility group variation in the country where vaccinated individuals believed their vaccine was developed to estimate the effect of *personally receiving a particular vaccine* on trust in the government of the country that they believed developed their vaccine. We thus evaluate the effect of receiving a vaccine perceived to have been developed in China, Russia, the UK, or the US relative to trust in other vaccine-developing foreign governments that an individual did not believe developed their vaccine. Second, in our broader sample of vaccine-eligible individuals, we experimentally examine how *information about the aggregate distribution of vaccines* to the respondent's country affects trust in the governments where the vaccines were developed. Specifically, we informed treated respondents of the rank and share of vaccines that their country had received from China, India, Russia, the UK, and the USA. We then assess how different rankings, and differences relative to respondents' prior beliefs, influence trust in foreign powers.

Across our analyses, the results indicate that vaccine distribution has influenced public perceptions of foreign powers among citizens of Latin America. Specifically, we find that trust in the government of the country where an individual believed their vaccine was developed increased, relative to individuals who believed their vaccine was developed in a different country, by approximately 0.2 standard deviations. This translates into a 7 percentage point net increase in the probability of trusting or strongly trusting that foreign government. Furthermore, respondents who were informed that their country had received the most, as opposed to least, vaccines from a particular vaccine-developing country increased their probability of trusting or strongly trusting that coun-

[6]Foreign policy tools that are "targeted, sustained, effective, and visible" are posited to be more potent means of increasing influence over foreign mass attitudes (Goldsmith, Horiuchi and Wood, 2014).

try's government by 12 percentage points. Consistent with a learning mechanism, the experimental effect on trust was also most pronounced among respondents who initially thought that a country had distributed relatively fewer vaccines. In each case, the positive effects on trust were largest for trust in China, although vaccine distribution significantly enhanced trust in Western powers as well. Given that vaccines have already reached and will continue to reach substantial populations, the evidence suggests that vaccine diplomacy has the potential to shape views of foreign powers in Latin America—and likely in other contexts—in ways that could entail geopolitical ramifications far beyond the pandemic.

By way of mechanisms, although citizens also became more cynical about the motives underlying vaccine distribution, positive perceptions appear to yield a net gain in trust across respondents. Both sets of analyses indicate that vaccine distribution significantly increased respondents' impression that foreign governments were trying to reduce the global spread of COVID-19. Moreover, the increases in trust induced by information provision were most pronounced among citizens principally perceiving public good motivations, while the likelihood that respondents perceived public good motivations relative to cynical drivers increased with the number of vaccines delivered to the respondent's country. Combined with the positive effects on trust, these analyses suggest that distributing COVID-19 vaccines makes a foreign state appear more attractive by conveying its willingness to pursue an important public good in the respondent's country.

Beyond illuminating a significant contemporary political issue, our findings advance the broader literature on foreign policy and public opinion in several ways. First, the extant literature has largely focused on domestic public opinion regarding one's own country's foreign policy—with a strong US and Western European bias (Howell and Pevehouse, 2007; Tomz, Weeks and Yarhi-Milo, 2020)—-and great powers' foreign policy influence on mass attitudes in developing countries toward their own governments (Baldwin and Winters, 2020; Blair and Roessler, 2021; Dietrich and Winters, 2015). In contrast, we join a handful of studies investigating how states' varied foreign policies—including international trade, investments, aid (Blair, Marty and Roessler, 2022; Eichenauer, Fuchs and Brückner, 2021; Kroenig, McAdam and Weber, 2010), and leader visits

(Goldsmith, Horiuchi and Matush, 2021)—shape citizen perceptions in the Global South toward *those foreign states' governments*. We show that diplomatic initiatives by foreign powers can increase trust in such powers—a critical step in the posited causal story of how states exert influence abroad—by altering citizens' perceptions of a foreign power's motivation to provide global public goods.

Second, our study rigorously examines the impact of an understudied dimension of statecraft—vaccine distribution—on foreign mass attitudes. We thus contribute to a sparse literature exploring the geopolitical benefits, in addition to humanitarian global health benefits, that great powers may secure through public health initiatives (Goldsmith, Horiuchi and Wood, 2014; Lee, 2021; Telias and Urdinez, forthcoming). Our focus on COVID-19 vaccines complements contemporaneous work by Urdinez and Winters (2021), which finds a positive but statistically insignificant difference in sentiments toward China across individuals from households that had and had not received a Chinese vaccine. Our study's observational component instead leverages within-eligibility group variation in the type of vaccine received and compares Chinese with Western vaccines, while its experimental component further considers the sociotropic dimension of vaccine distribution. We also provide evidence suggesting that citizen responses are primarily driven by perceptions of a foreign government's motivation to provide global public goods. This finding indicates that citizens may come to view the motives of foreign governments skeptically only when encouraged to do so by the media, as Rhee, Crabtree and Horiuchi (2023) find in their analysis of US citizen perceptions of Russian vaccines, or when learning that comparatively few vaccines were received from a particular foreign country.

Third, we help extend the geographic scope of scholarship on the foreign audience benefits of diplomacy to Latin America.[7] Our paper examines not just the effect of a single country's

[7]Existing research has largely focused on characterizing attitudes toward foreign powers like China and the US and how they change over time or across groups (Azpuru, 2016; Carreras, 2017; Carreras, Visconti and Acácio, 2021). Some researchers have examined the effects of Chinese economic activities on public opinion in Latin America (Eichenauer, Fuchs and Brückner, 2021), while others have examined the effects of Chinese distribution of vaccines and medical equipment (Telias and Urdinez, forthcoming; Urdinez and Winters, 2021). However, we are not aware of research exploring the effects of vaccine distribution across different vaccine-developing countries or documenting the effectiveness of public diplomacy in the region.

diplomacy on foreign public opinion, but rather the effects of great powers in strategic rivalry, reflecting the realities of global geopolitical competition over the hearts and minds of citizens in the Global South. The variety of vaccines received by countries in the region allows us to compare diplomatic benefits accrued for different vaccine-developing countries, including China, India, Russia, the UK, and the US.

2 Diplomacy and foreign public opinion

Public trust is important to foreign policy. It underpins alliances, facilitates international cooperation, and advances the projection of soft and hard power. Goldsmith and Horiuchi (2012), for example, show that foreign opinion affects troop commitments to the war in Iraq, policy toward the International Criminal Court, and voting decisions in the UN General Assembly. As summarized by Mogensen (2015), trust in foreign countries makes citizens more likely to favor diplomatic solutions (Brewer et al., 2004; Sides and Gross, 2013) and internationalism more generally (Ruzicka and Wheeler, 2010).

Given this importance of trust, states pursue various policies to boost their public image abroad. These include foreign aid, leader visits, humanitarian military interventions, disaster relief, global health programming, cultural exports, and educational exchange programs. Despite the key role of trust in international relations, tests of the effects of foreign policy on foreign public trust are relatively limited and evidence is mixed (Mogensen, 2015).

On the one hand, skeptics argue that diplomacy may fail to shift international attitudes. This is because beneficiaries of foreign policies may struggle to attribute responsibility to the sender, regard sending states as primarily self-serving (Rhee, Crabtree and Horiuchi, 2023), or perceive the interventions to be ineffective or insignificant (Goldsmith, Horiuchi and Wood, 2014:91). Alternatively, citizens may already have strong and stable evaluations of great powers (Carreras, Visconti and Acácio, 2021).

On the other hand, advocates find that foreign aid and public diplomacy can significantly shift

public opinion abroad (Dreher and Sturm, 2012; Mor, 2006; Nye, 2008). For example, an evaluation of the US President's Emergency Plan for AIDS Relief finds that exposure to the HIV/AIDS program increased approval of the US government expressed by foreign respondents (Goldsmith, Horiuchi and Wood, 2014). Suggesting that positive shifts in public opinion depend on an intervention's efficacy and execution, Blair, Marty and Roessler (2022) find—across six African countries—that Chinese aid projects actually decreased recipients' affinity for China and increased their affinity for the US whereas aid from the US appeared to achieve its desired aim of weakening support for China while strengthening support for the US. Even high-level diplomatic visits improve public opinion abroad (Goldsmith, Horiuchi and Matush, 2021).

2.1 How vaccine diplomacy can increase trust in foreign governments

States have long used global health diplomacy—"international aid or cooperation meant to promote health or that uses health programming to promote non-health-related foreign aims" (Fazal, 2020:E78)—as part of their foreign policy. China, for example, has engaged in a decades-old "Health Silk Road" as an integral component of its Belt and Road Initiative.[8] Recently, health diplomacy's use has accelerated dramatically due to increased bilateralism, heightened US-China competition over global public opinion, and the COVID-19 pandemic.[9] Existing scholarship on these diplomatic initiatives has focused mostly on public health outcomes (Davies et al., 2014; Katz et al., 2011). In centering our analysis on vaccine diplomacy, we join a smaller political science literature emphasizing the bilateral and strategic dimensions of health diplomacy.[10]

Individuals may develop trust in foreign governments through various forms of exposure to vaccine diplomacy. We focus on two important pathways—personal experience and aggregate information—through which individuals encounter and learn about the vaccines that their country received.

[8] "Don't believe the hype about China's 'vaccine diplomacy' in Africa," *Washington Post*, 3/5/2021. On health diplomacy, see also Huang (2021), Lee (2021), and Telias and Urdinez (forthcoming).

[9] See, for example, Chan, Gahr Store and Kouchner (2008). Diplomacy has long comprised vaccines as part of its repertoire (Huang, 2021).

[10] See Drager and Fidler (2007), Feldbaum and Michaud (2010), Katz et al. (2011), and Vanderwagen (2006) for the interaction between foreign policy interests and health diplomacy interventions.

Personal foundations for trust derive from the experience of an individual receiving a particular vaccine. Given the salience of the global pandemic to extremely hard-hit publics, vaccines became a matter of life and death, and thus fulfill a critical need. Although variation exists, the vaccines proved effective at preventing hospitalization and death from COVID-19, and were largely perceived as such. This perception was particularly strong during the period that we study—the beginning of the mass vaccine rollout in Spring 2021. Furthermore, individuals may also generalize from their own experience of receiving a vaccine. Specifically, they might regard their experience as a signal that the foreign government which provided their particular vaccine distributed vaccines to many other people like themselves, and would continue to act favorably toward people like them in the future. Trust in a particular foreign government may then derive from an individual's perception of an appropriate and extensively-distributed vaccine developed in that foreign country, which prevented disease and enabled citizens to return to work and normal life with greater confidence.

Citizens can also learn to trust foreign governments from information about aggregate vaccine distribution within their country. Vaccine distribution is visible and often publicized, providing the public with information about the sources and positive effects of the vaccines that they and their compatriots received. This experience of exposure to information about national-level vaccine distribution may lead individuals to update their perceptions of vaccine-developer countries (Fordham and Kleinberg, 2012; Kinder and Kiewiet, 1981; Mansfield and Mutz, 2009). In particular, receiving a signal—whether through the media, from government, from peers, or via other means—indicating that a foreign power distributed many vaccines that may have contributed to limiting the spread of a deadly disease, shortening lockdowns, or facilitating economic recovery in a citizen's country may increase trust in that country's government (Baum and Groeling, 2009; Berinsky, 2009; Brody, 1991; Saunders, 2015; Zaller, 1992). This is likely to operate through citizens learning that a foreign government provided many valuable public goods, or at least more than previously expected, as studies in other contexts have shown (e.g. Bhandari, Larreguy and Marshall, forthcoming; Lenz, 2009).

Although personal and aggregated exposure to vaccine distribution could affect trust in foreign

governments in various ways, we propose that citizens' perceptions of foreign countries' aims in distributing vaccines are central. The foreign policy literature posits that public approval of the projection of power abroad will rise if foreign publics believe that a state's foreign policy is shaped by normatively-desirable notions (Kertzer, 2013). In our context, this suggests that if vaccine diplomacy conveys a country's concern for global public health, effectiveness in addressing public health challenges, or support for a particular recipient country and its population—and citizens interpret the country's motivations for vaccine distribution in this light—vaccine distribution likely will then cultivate trust in the country exercising such diplomacy. Such an increase in trust would reflect citizens coming to believe that a foreign government would continue to act in the citizen's interests in the future. However, if foreign citizens instead mostly perceive the vaccine-developing country's motives more cynically—as serving the country's strategic interests, such as by increasing foreign dependence, profit, and influence—and offered only in exchange for recipient countries adopting specific policy positions, then vaccine diplomacy transforms into coercive power in ways that might diminish its impact on trust.

Leaders' public rhetoric suggests that they believed vaccine diplomacy would cultivate international support through the channels just described. President Biden aptly explained that "Planes carrying vaccines from the United States have already landed in 100 countries, bringing people all over the world a little 'dose of hope,' direct from the American people—and, importantly, [with] no strings attached."[11] China has similarly underscored the humanitarian nature of its vaccine distribution, with its embassy in El Salvador tweeting that "China apportions vaccines to El Salvador without concern for geopolitical interest, without calculating economic benefits, and without imposing political conditions."[12]

2.2 Hypotheses

The preceding discussion suggests the following hypotheses relating to shifts in individual-level trust in foreign governments associated with vaccine provision:

[11] Remarks by President Biden Before the 76th Session of the United Nations General Assembly, 9/21/21.
[12] Chinese Embassy in El Salvador, 7/26/2021.

Hypothesis 1 (H1)**.** *Among individuals who received a vaccine, trust in the foreign government of the country that developed the particular vaccine that they personally received will increase.*

Hypothesis 2 (H2)**.** *Learning about aggregate vaccine distribution in one's country will increase an individual's trust in the countries that provided the most vaccines, especially among individuals who underestimated the relative number of vaccines sent by these countries.*

Hypothesis 3 (H3)**.** *Receiving a vaccine developed by a foreign power or learning about large-scale aggregate vaccine distribution by a foreign power will cause individuals to become more likely to perceive the foreign power as motivated by the pursuit of a shared public good.*

We test H1 in Section 5 by estimating the effect of personally receiving a particular vaccine on trust in the country where that vaccine was developed, relative to trust in that same country among individuals who received a different vaccine. Section 6 tests H2 by experimentally providing information about aggregate vaccine distribution within a individual's country. In each section, we test H3 by further examining changes in perceptions of the motivations of vaccine-developing countries for distributing COVID-19 vaccines. Before detailing our observational and experimental identification strategies and reporting our results, we next describe our empirical setting and survey data.

3 COVID-19 vaccine distribution in Latin America

Latin America provides an important context to explore the impacts of vaccine diplomacy because greatpower rivalry for Latin American public opinion has played out dramatically in the era of the coronavirus pandemic, which has had a substantial impact on the region. Cumulative deaths due to COVID-19 have ranked among the highest around the world, ranging from 57,580 in Chile to 664,000 in Brazil as of May 2022. Perú has had the highest mortality rate from COVID-19, with an estimated 645 COVID-19 deaths per 100,000 residents. In addition to mortality, the economic and social tolls of the pandemic in the region are widespread. Latin America experienced an economic

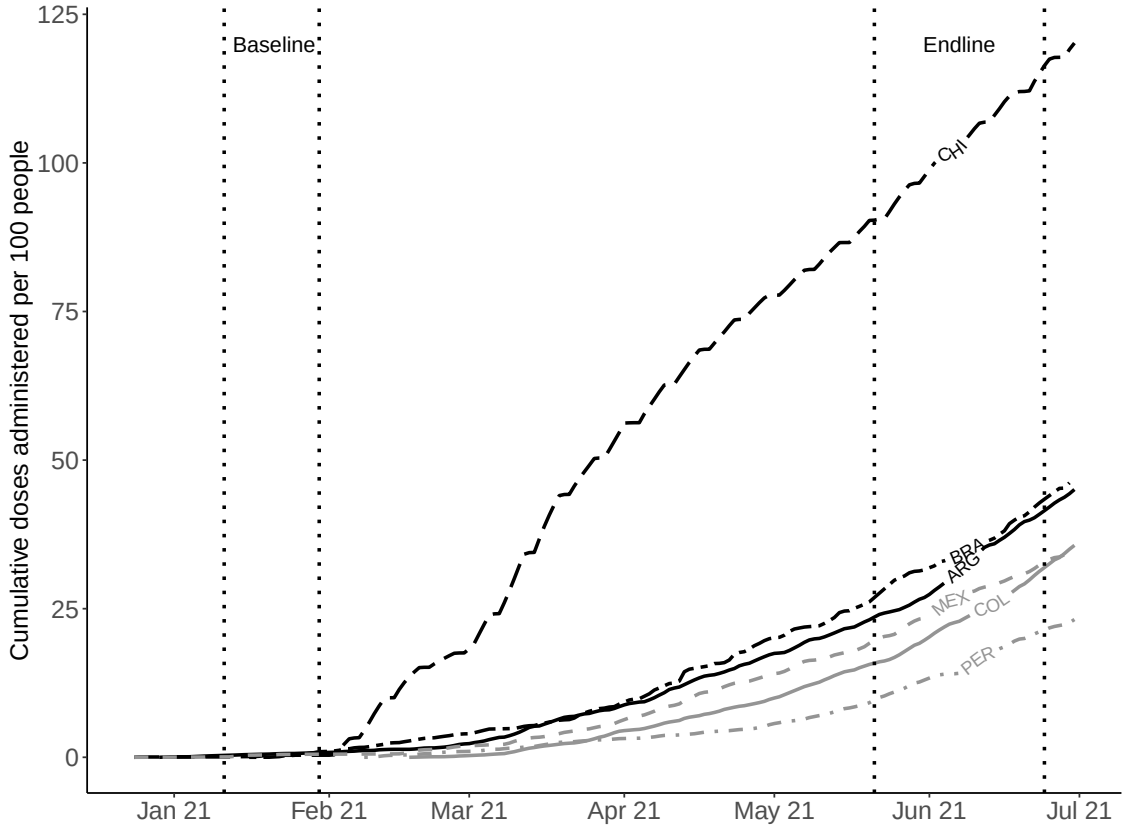
recession, increases in poverty, years of school closures, and disruptions to other essential public health programs.

Vaccine provision thus has had the potential to become an important foreign policy tool in the region. While experimental tests of the efficacy of the vaccines were conducted in some Latin American countries in 2020, the mass rollout of vaccines across the countries in our study—Argentina, Brazil, Chile, Colombia, México, and Perú—did not begin until late January and early February 2021. The earliest mass vaccination program began in Brazil on January 19, 2021, with Chile following on February 3, 2021; México, Perú, Argentina, and Colombia launched their mass vaccination programs between February 9 and February 18, 2021.[13] After initially prioritizing healthcare workers, the bulk of these programs moved towards vaccinating the general population by late March or April 2021, working downwards in age and vulnerability brackets to prioritize access. Figure 1 shows the cumulative administration of vaccine doses per 100 residents in our six countries of interest across our study. By June 2021, Chile had vaccinated the greatest percentage of its residents, while Perú had the lowest vaccination rate at that time.

The composition of available vaccines varied considerably within and across countries in Latin America. By the end of our study in late June 2021, Argentina had contracts for vaccines developed in Russia (Sputnik V), the UK (AstraZeneca), China (SinoPharm), and India (Covishield), although AstraZeneca doses had not begun to be rolled out. At this time, China was the largest supplier of vaccines—whether SinoPharm or Sinovac—in Brazil, Chile, and Colombia, with the US supplying the second most vaccines—mostly developed by Pfizer-BioNTech—in Chile and Colombia. Brazil rounded out its supply with AstraZeneca vaccines developed in the UK. In México and Perú, on the other hand, the US supplied the greatest number of doses, with China supplying the second most. Since the end of our study, vaccines produced in the US have become more prevalent and concerns about efficacy, particularly with respect to novel variants, have shifted government strategies for vaccine acquisition.

[13] Appendix Section A.1 explains country-by-country eligibility guidelines and rollout in greater detail.

Figure 1: Cumulative doses per 100 people across six Latin American countries and survey dates



Note: Created with data from Our World in Data.

4 Survey data

Our tests of hypotheses H1-H3 draw from an original panel survey conducted in Argentina, Brazil, Chile, Colombia, México, and Perú. These six countries rank among the most populous and worst hit by the pandemic in Latin America. The first survey was conducted in mid-to-late January 2021 and the followup survey was conducted in May and June 2021. The timing of these surveys provides a unique opportunity to examine changes in citizen attitudes toward foreign powers before and after the region's mass vaccination campaigns began.

The baseline survey recruited respondents from a large online panel maintained by Netquest. Invitations were updated dynamically with the goal of matching the marginal distribution of each nation's population in terms of its gender, age, socioeconomic level, and region. Because the baseline survey was principally designed to understand COVID-19 vaccine hesitancy and how to over-

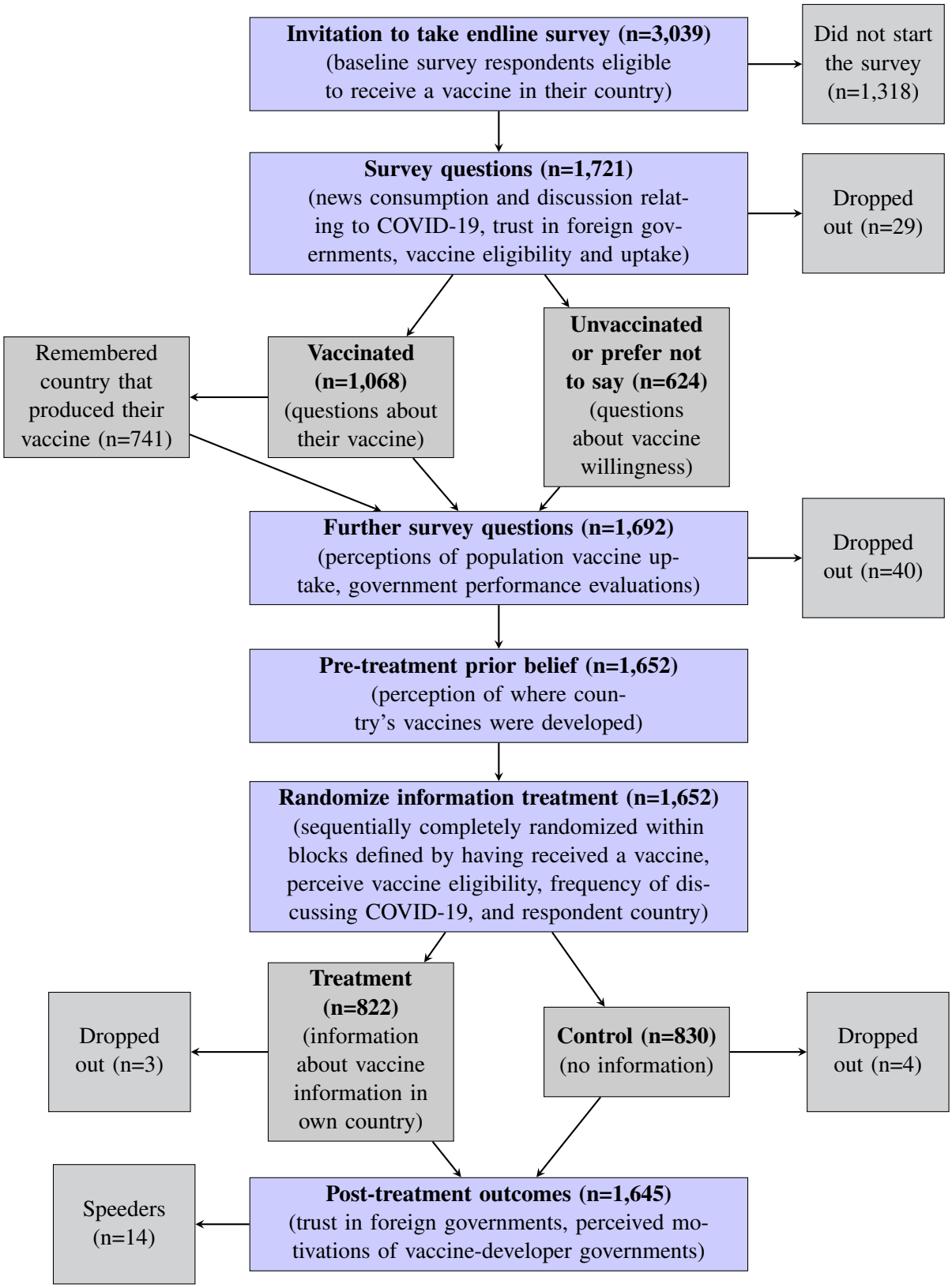
come it (see Argote et al., 2021), we screened out respondents who were willing to vaccinate within two months of a vaccine becoming available to them. This yields a sample with relatively low prior dispositions towards COVID-19 vaccination, although the 62% of respondents whom we classified as initially-hesitant are relatively similar in terms of demographics to respondents who were screened out. These respondents were then asked about their demographics and socioeconomic status, risk tolerance and rate of time preference, news consumption, views on COVID-19 vaccines and their government's management of the pandemic, pre-existing health conditions, social and political dispositions, and trust in a variety of domestic and international institutions. Ultimately, 7,080 people—distributed evenly across our six countries—completed the baseline survey.

The followup survey was designed to understand how vaccine distribution shaped attitudes toward foreign governments. Accordingly, we invited the 3,039 respondents who had become eligible to receive a vaccine in their country by May 2021 to complete an endline survey. As in the baseline survey, we again elicited respondent trust in the current governments of China, India, Russia, the UK, and the US.[14] The endline survey further asked respondents if they had received their first vaccine dose, how long they waited to get vaccinated, the country in which they believed their vaccine was developed, and the name of the vaccine they received. At the end of this survey, we embedded the information experiment described in Section 6. Figure 2 summarizes the flow of the endline survey, while Appendix Section A.3 describes the survey protocols in detail.

Our final sample is not nationally representative because it recruits from an online panel, which under-represents populations lacking internet connectivity, and focuses on participants who registered some hesitancy about vaccinating in January 2021, were eligible to be vaccinated by May 2021, and completed our endline survey. We characterize differences with other populations in Appendix Table A2, which reports summary statistics, comparing individuals who completed our endline sample—both those that were vaccinated (included in our observational study) and all respondents (included in our experimental study)—with the most recent census data for each country's population and the 2021 round of the Latin American Public Opinion Project (LAPOP) sur-

[14] In the baseline survey, we asked about the US government under both Presidents Biden and Trump, but we focus on trust in Biden's US government to maintain continuity with the endline survey.

Figure 2: Overview of endline survey flow and treatment assignments



Note: The number in each cell indicates the number of respondents who reached that stage of the study.

vey. Our endline sample is older, more educated, and of higher socioeconomic status than the general population. Nonetheless, both our experimental and vaccinated samples are relatively similar in terms of observables—including attitudes toward COVID-19 and foreign governments—to the 2021 LAPOP sample, which was conducted by telephone during the pandemic.

Although our sample may be unrepresentative in ways that are common to online surveys, our panel survey facilitates an observational research design that few other studies can emulate. First, the timing of the surveys enables us to assess respondents' beliefs before and after mass vaccination campaigns began in each country. Second, the endline survey elicited detailed information from a large number of vaccinated respondents about the particular vaccine they received. Third, our baseline covariates allow us to adjust for prior trust in foreign governments and estimate heterogeneous effects.

We focus on the same set of outcomes measuring trust in the major vaccine-developing foreign governments—China, India, Russia, the UK, and the US—across our observational and experimental analyses. During the baseline survey and twice within the endline survey (at the beginning and again after treatment exposure), respondents were asked: "How much trust do you have in the current governments of the following countries?" Respondents selected among five answers each time: no trust at all, little trust, some trust, a lot of trust, or don't know. We then constructed ordinal and categorical measures of trust. The ordinal scale ranges from 1 (no trust at all) to 4 (a lot of trust), with "don't know" responses coded at the median of 2.5.[15] The binary outcome instead classifies a respondent as trusting a country if they report some or a lot of trust. While the latter outcome encodes less information, it does not rely on imputing an ordinal value to "don't know" responses. The distribution of trust by vaccine-developer country can be found in Figure A1 in Appendix A.3.2.

[15]Tables A7 and A8 report similar results when applying listwise deletion to "don't know" responses.

5 The effect of personally receiving a vaccine

Our first empirical analysis examines whether the particular vaccine that *an individual received* shapes their trust in the government of the country where that vaccine was developed, relative to the governments of other vaccine-developing nations. Following our hypothesis (H1), the mass distribution of vaccines could significantly recalibrate trust in foreign powers if citizens attribute personally receiving a vaccine—and its personal or altruistic expected benefits—to the country where the vaccine was developed.

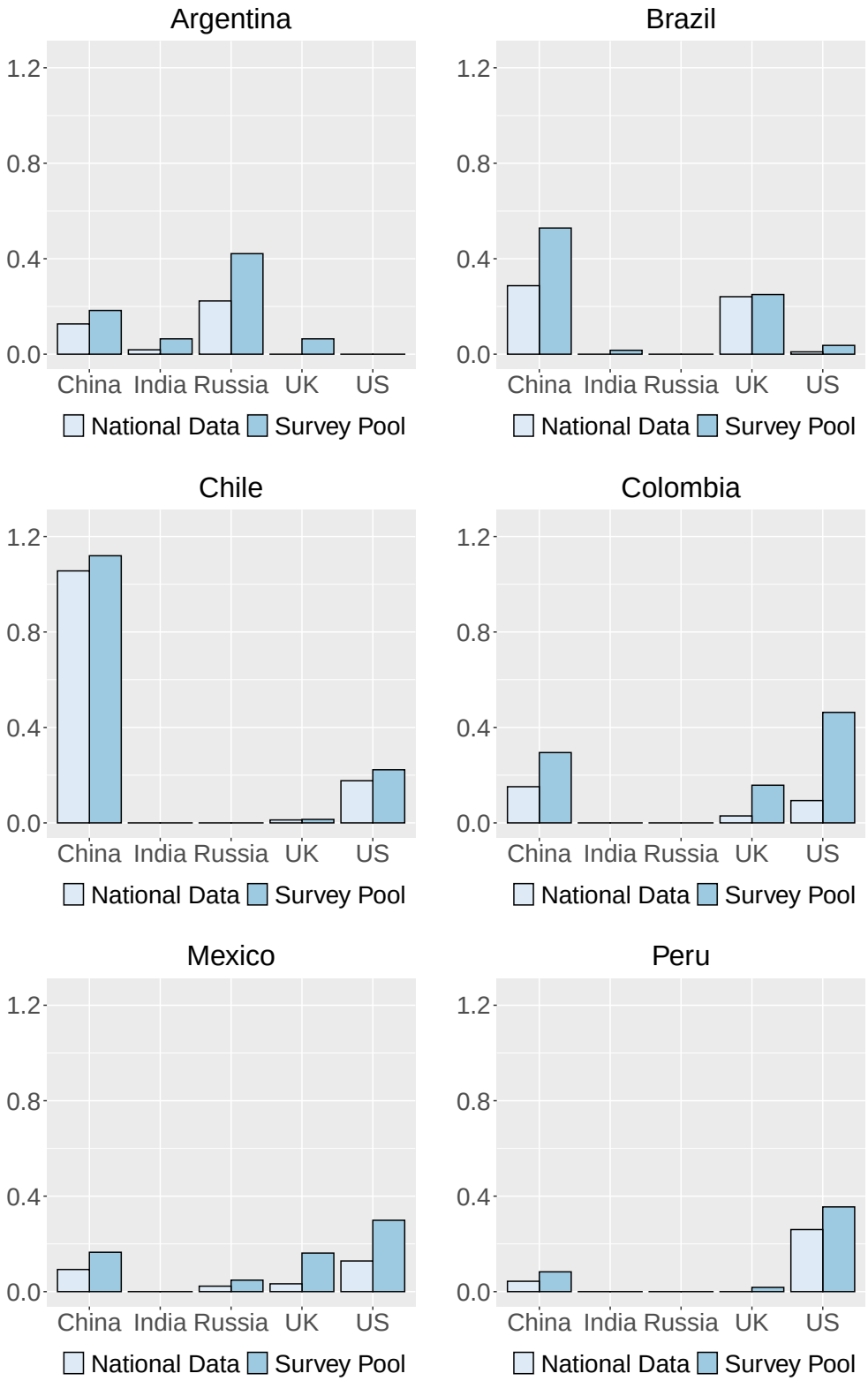
5.1 Research design

We evaluate this first hypothesis among the 41% of endline respondents who reported having received at least one dose of a COVID-19 vaccine and who recalled the country where their vaccine was developed. More than a third of these vaccinated respondents resided in Chile, where vaccines became accessible earliest, while only around 10% were from Colombia or Perú. The average vaccinated respondent waited 4.4 weeks after a COVID-19 vaccine became available to them before getting vaccinated; 56% had received a second dose by the time of our endline survey.

Figure 3 documents considerable heterogeneity across countries at the time of our survey—both at the national level for all adults and among our vaccine-eligible endline survey respondents—in the number of vaccines administered from manufacturers based in different countries. Vaccines developed by Chinese firms were common across our sample of Latin American countries; British, Russian, and US vaccines were also common in some countries. Only Argentina received vaccines developed in India; since just 32 respondents reported receiving an Indian vaccine, we drop these individuals from this analysis.

We define our "treatment" variable as the country in which a vaccinated respondent believed their vaccine was developed, as we expect changes in trust in government will be most responsive to *perceptions* of the country where the vaccine was developed. Such perceptions are a critical first step toward generating trust in foreign governments because they attribute responsibility for vaccine

Figure 3: Number of vaccine doses per adult from each vaccine-developer country (in May 2021)



Notes: Doses per adult (aged 18 or above) can exceed one because COVID-19 vaccines consist of two doses. In our sample, there are 182 Argentinians, and 96 Brazilians, 312 Chileans, 38 Colombians, 89 Mexicans, and 38 Peruvians that reported being vaccinated and recalled which country developed their vaccine.

development to a given country. Nevertheless, similar results emerge when we define treatment by the nationality of the manufacturer of the specific vaccine that the respondent reported receiving or when dropping respondents where perception and manufacturer country disagree, as Appendix Tables A7 and A8 show.[16]

Identifying the causal effect of receiving one vaccine over another is challenging for two main reasons. First, vaccine eligibility and the supply of available vaccines varied across time and space. As Appendix Section A.1 explains in detail, the six countries in our study rolled out vaccines at different rates for different groups, although eligibility criteria generally prioritized older individuals and individuals with pre-existing conditions before progressively extending access to younger and healthier cohorts.[17] Furthermore, because different countries negotiated access to different vaccines and shipments for different vaccines arrived at different times, the vaccines immediately available to respondents varied across countries and by eligibility group within countries. Consequently, spurious correlations between the vaccine an individual received and trust in foreign governments could emerge if respondents' trust in foreign governments is correlated with the factors that determine when an individual became eligible to receive a vaccine or the set of vaccines that a country (or locality) obtained.

Second, although individuals who first became eligible to receive vaccines were generally invited to receive an unspecified vaccine from a particular place on a particular date or set of dates (Urdinez and Winters, 2021), some individuals could have waited for or sought out particular vaccines beyond those available to them.[18] If differences in trust in foreign governments shaped citizens' preferences between vaccines or correlated with the information individuals had about each vaccine, "vaccine shopping" could confound the association between the vaccine an individual ultimately received and their trust in that country's government.

[16]The perceived country did not match the country of the manufacturer that an individual reported for their vaccine (e.g. a respondent reported receiving a Chinese vaccine and that they received a Pfizer shot) in only 9% of cases.

[17]Appendix Section A.2 describes adherence to rollout protocols by country. Eligibility rules were closely adhered to in Chile and Colombia, but were more localized and haphazard in Argentina, Brazil, México, and Perú. Eligibility groups in the latter four countries are thus more approximate.

[18]Cases of queue-jumping and obtaining access to more efficacious vaccines by political elites in Argentina and Perú have caused scandals but have been rare. Wealthier individuals have also travelled to receive vaccines abroad, but they represent small segments of the population.

We combat these concerns by leveraging the panel structure of our data and *within-country-eligibility group* variation in the vaccine-developer country from which vaccinated respondents reported receiving their vaccine. Specifically, we exploit plausibly exogenous variation in which vaccines were available by comparing individuals who received different vaccines but became eligible for a vaccine in their country around the same time. Within each of the 23 country-specific eligibility groupings, the inconsistent stocks of specific vaccines and local variation in which vaccines were sent where and when meant that the vaccine available to an individual at a vaccination site on the day when they sought to get vaccinated was largely determined by chance. Our robustness checks further exploit variation within regions and municipalities to account for any differences in where governments allocated particular vaccines. To mitigate the risk of selective sorting when a respondent had the capacity to pick multiple vaccines, we leverage our panel data to condition on a respondent's prior levels of trust in foreign governments. Within country-eligibility groups and for a given level of prior trust in foreign governments, the vaccine that a vaccinated individual received may then be conditionally ignorable.

Under this identifying assumption, we estimate the effect of receiving a vaccine that a respondent believed was developed in a particular country on trust in that country's government, relative to trust in the governments of other vaccine-developing countries. We first estimate the average effect across foreign governments by pooling estimates from each of the four vaccine-developing countries using the following OLS regression:[19]

$$Trust_{dic} = \alpha_{dgc} + \sum_{r} \beta_{dr} \mathbb{1}[Prior\ trust_{dic} = r] + \tau\, Country\ developed\ vaccine_{dic} + \varepsilon_{dic} \qquad (1)$$

where $Trust_{dic}$ is a measure of trust in the government of country $d \in \{China,\ Russia,\ UK,\ US\}$ for respondent i located in country $c \in \{Argentina,\ Brazil,\ Chile,\ Colombia,\ México,\ Perú\}$, and $Country\ developed\ vaccine_{dic}$ indicates whether the respondent reported receiving a vaccine devel-

[19] We use OLS for our main regression estimates to avoid the incidental parameter problem that arises when including fixed effects (Neyman and Scott, 1948). Nevertheless, the estimates in Tables A7 and A8 yield similar average marginal effects when using ordered logit and logit specifications, respectively, for our ordinal and binary trust outcome variables.

oped in country d. We include country-eligibility group $\times$ vaccine-developer country fixed effects, denoted by α_{dgc} where subscript g indicates eligibility group, to ensure that we leverage variation only in the vaccine received by individuals who became eligible to receive a vaccine around the same time within their country. Indicators for each baseline level of trust r (including "don't know") in each vaccine-developer country, $Prior\ trust_{dic}$, are included to flexibly guard against baseline differences in trust across individuals driving the results. We also estimate the effect for each vaccine-developing country separately using analogous regressions that restrict attention to trust in a specific vaccine-developing country. Robust standard errors are clustered by respondent.

To validate our identification strategy, we examine whether individuals who reported receiving a vaccine developed in a particular country systematically differ in other ways. Appendix Table A4 shows that, conditional on eligibility group within a country, the country that an individual believed developed their vaccine is balanced across predetermined individual-level covariates from our baseline survey: F-tests only reject the null hypothesis of no significant difference in characteristic means across respondents who received different vaccines for 10 of 86 covariates measured before vaccination in the baseline survey. Importantly, we detect no significant differences in baseline trust in current foreign governments, political dispositions, socioeconomic indicators, and views on how the pandemic is being managed. The few statistically significant differences arise for some questions about news consumption and comorbidities.[20] These tests suggest that certain types of individuals did not systematically select into or recall receiving particular vaccines nor that the propensity of different types of individual to complete the endline survey varied with the vaccine they reported receiving. Below, we further demonstrate robustness to adjusting for imbalanced as well as all predetermined covariates.

5.2 Results

Pooling across trust in China, Russia, the UK, and the US, column (1) in Table 1 reports a positive and statistically significant average effect of receiving a vaccine that an individual believed was

[20] Appendix Table A4 shows that further adjusting for baseline trust does little to alter balance.

Table 1: The effect of receiving a particular vaccine on an individual's trust in the government of the country where the vaccine was developed

	Pooling all governments (1)	Chinese government (2)	Russian government (3)	UK government (4)	US government (5)
Panel A: Outcome: trust in foreign government scale					
Country developed vaccine	0.171***	0.236***	-0.001	0.213**	0.152*
	(0.039)	(0.084)	(0.128)	(0.098)	(0.089)
R^2	0.28	0.23	0.27	0.18	0.20
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}
Control outcome mean	2.73	2.25	2.58	2.96	2.90
Control outcome std. dev.	0.92	0.92	0.93	0.83	0.89
Panel B: Outcome: some or a lot of trust in foreign government indicator					
Country developed vaccine	0.069***	0.100**	-0.047	0.109**	0.068
	(0.021)	(0.044)	(0.069)	(0.054)	(0.049)
R^2	0.22	0.21	0.19	0.14	0.13
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Control outcome mean	0.59	0.35	0.51	0.70	0.67
Control outcome std. dev.	0.49	0.48	0.50	0.46	0.47
Country developed vaccine mean	0.25	0.53	0.20	0.11	0.17
Number of fixed effects	92	23	23	23	23
Observations	2,836	709	709	709	709

Notes: The specification in each column includes eligibility group × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects and country-specific indicators for each level of pre-treatment baseline survey trust, which are omitted to save space, and is estimated using OLS. Eligibility groups are defined in Appendix Table A3. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

developed in a particular country on trust in that country's government. Relative to trust in the governments of other vaccine-developing countries, the point estimate in panel A indicates that respondents' trust in the government of the country where their vaccine was developed increased by 0.17 levels, or 0.2 standard deviations, on the four-point scale ranging from no trust (1) to a lot of trust (4). Using a binary outcome, panel B similarly reports a 7 percentage point, or 12%, increase in the probability that an individual reported some or a lot of trust in the government of the country where they believed their vaccine was developed. Appendix Table A5 shows that these estimates are positive in each respondent country, although the effect magnitude varies by country and estimates are less precise for countries with fewer respondents.

To help assess whether the effects of vaccine diplomacy generalize to the broader population, we reweight our observations along observable dimensions. Using the most recent available census microdata, we apply rake weights for the respondent's age category, education category, region, gender, and socioeconomic level to match the marginal population distribution for adults in each country. The results reported in Appendix Table A6 suggest that the effects of vaccine diplomacy may be similar at the population level. However, the generalizability of these estimates should be treated with caution because we can only reweight observations according to a few observable characteristics.

Supporting H1, these findings indicate that personal experience of vaccine distribution—which has the potential to influence entire populations—could meaningfully alter attitudes toward foreign powers. Moreover, our estimates suggest that vaccine provision is at least as effective as other foreign policy tools. The effect of vaccine distribution on our binary trust outcome is around three times larger than the increase in the probability that an individual approves of a foreign government immediately after a visit from their leader (Goldsmith, Horiuchi and Matush, 2021), despite the fact that our outcome is not measured immediately after vaccination. In the case of local foreign aid projects, Blair, Marty and Roessler (2022) find that the positive effect of US projects on the belief that the US model of development is best is around double the magnitude of the effect of a respondent's vaccination on trust in the government where the vaccine was developed in our sample. Our estimates also exceed the null effects of Chinese exports, aid, and investment in Latin America (Eichenauer, Fuchs and Brückner, 2021).

Columns (2)-(5) next distinguish effects by foreign government. Compared with respondents who reported receiving vaccines developed in other countries, column (2) shows that receiving a vaccine developed in China produced a particularly pronounced increase in trust in the Chinese government. For both the ordinal and binary outcome variable, the increase in trust in the Chinese government of around a quarter of a standard deviation is almost double the effect on trust in the US government registered in column (5). This result contrasts with the findings of Blair, Marty and Roessler (2022) and Eichenauer, Fuchs and Brückner (2021), and suggests that respondents

may have attributed less self-serving and strategic motivations to China's vaccine distribution than development projects funded by foreign aid. Column (3) reports no effect on trust in the Russian government, although its Sputnik V vaccine had only been distributed in Argentina, but column (4) shows a large and statistically significant increase in trust in the UK government among the small number of respondents who reported receiving a vaccine developed there. The effect on trust in the US government is also positive and non-trivial in magnitude, albeit only statistically significant at the 10% significance level for the trust scale outcome. Although the summary statistics at the foot of each panel in Table 1 show that baseline trust in China is lower than for the other foreign powers, the baseline level of trust is sufficiently low in each case that the slightly larger effects on trust in China are unlikely to arise due to ceiling effects.

These findings survive a battery of robustness tests reported in Appendix Section A.4.4. First, we address the concern that differences in the vaccines that survey respondents received are correlated with local differences in where different types of vaccines were delivered. By including country-eligibility group $\times$ vaccine-developer country $\times$ locality fixed effects, we show that our results continue to hold within regions and even within municipalities. Second, we address the possibility that certain types of individuals within particular eligibility (and location) groups may have sought out particular vaccines or were more likely to remember receiving certain vaccines. Suggesting that differences in the types of individuals who reported receiving different vaccines are not driving the results, we obtain similar estimates after adjusting for the 10 statistically significant imbalances as well as all 86 individual-level covariates over which we examined balance. Third, we consider a difference-in-differences analysis comparing changes in the trust of respondents who reported receiving different vaccines with changes in the trust of *unvaccinated* respondents. The results again indicate that individuals became significantly more trusting of the government of the country where their particular vaccine was developed. Finally, additional specification tests provide similar estimates when defining treatment by the country that manufactured the specific brand of vaccine a respondent reported receiving, dropping respondents who reported receiving a vaccine from a country that did not manufacture the vaccine they reported receiving, dropping "don't

know" responses to our trust outcome, and using ordered logit or logit to estimate equation (1).

5.3 Potential mechanisms

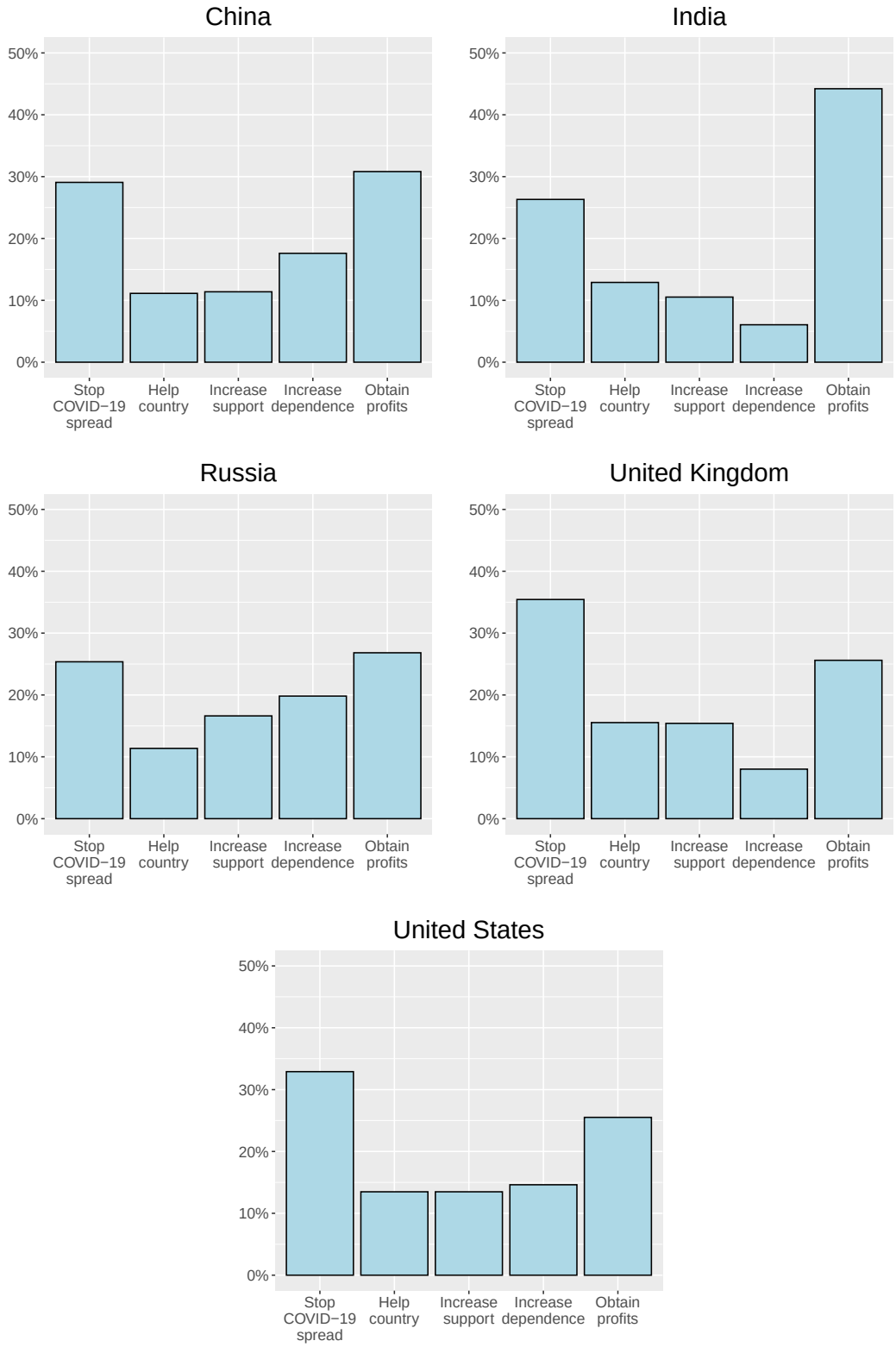
The preceding results show that personal experience of receiving a COVID-19 vaccine increased the average individual's trust in the government of the country where they believed their vaccine was developed. We next investigate whether this is because personal experiences with vaccine distribution lead respondents to perceive foreign governments as possessing normatively desirable motives. We begin by examining whether receiving a particular vaccine affected perceptions of broader vaccine distribution within a respondent's country. We then test H3 by examining whether receiving a particular vaccine induces respondents to perceive the corresponding foreign government to be motivated by the global public good, rather than by more cynical dincentives.

Receiving a particular vaccine may affect citizen trust in foreign governments by inducing a respondent to believe that people like them would benefit from future policies too. Such a belief would likely stem from a respondent coming to believe that many other people like themselves also received the same vaccine. We test this by asking respondents to rank China, India, Russia, the UK, and the US in order of which country they believed had developed more of the vaccines available in their country. We then estimate equation (1) with the perceived rank as the outcome, where first is denoted by 5 and last is given by 1.

The results show that personally receiving a particular vaccine indeed increased the likelihood that a respondent believed that vaccines from the country where their vaccine was developed were widespread. The pooled estimate in column (1) of Table 2 shows that the perceived ranking of the country that an individual believed developed the vaccine that they personally received significantly increased by half a rank. Columns (2)-(5) show that respondents who reported receiving different vaccines updated similarly about each foreign government. Early in the mass rollout, the vaccine an individual received therefore seems to have shaped perceptions of the extent of a foreign government's vaccine diplomacy.

We next explore the mechanisms linking the experience of receiving a particular vaccine to trust

Figure 4: Respondents perceptions of motivation for developing vaccines, by vaccine-developing country



Note: Each figure pools initial endline responses across respondents from all countries.

Table 2: The effect of receiving a particular vaccine on an individual's ranking of the countries that developed most vaccines distributed in their country

	Pooling all governments (1)	Chinese government (2)	Russian government (3)	UK government (4)	US government (5)
Country developed vaccine	0.571***	0.497***	0.468**	0.659***	0.681***
	(0.078)	(0.120)	(0.185)	(0.171)	(0.145)
R^2	0.26	0.13	0.26	0.08	0.21
Outcome range	{1,2,3,4,5}	{1,2,3,4,5}	{1,2,3,4,5}	{1,2,3,4,5}	{1,2,3,4,5}
Control outcome mean	3.00	3.71	2.79	2.89	2.92
Control outcome std. dev.	1.35	1.24	1.36	1.24	1.40
Country developed vaccine mean	0.25	0.53	0.20	0.10	0.17
Number of blocks	92	23	23	23	23
Observations	2,808	702	702	702	702

Notes: The specification in each column includes eligibility group × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects and country-specific indicators for each level of pre-treatment baseline survey trust, which are omitted to save space, and is estimated using OLS. Eligibility groups are defined in Appendix Table A3. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

in foreign governments by asking respondents *why* they thought the vaccines from the three countries that delivered most vaccines to their country were being distributed. Specifically, respondents were asked at the end of the survey which of the following reasons they believed motivated the distribution of vaccines by each of these countries: to stop the spread of COVID-19 around the world; to help citizens of the respondent's country; to increase support for the vaccine-developer country within the respondent's country; to increase dependence on the vaccine-developer country; or for economic profit. As Figure 4 indicates, stopping the global spread of the pandemic was the most popular answer among our vaccinated respondents (48% agreed). Many were also somewhat cynical: 37% believed that the leading vaccine-developer countries were motivated by profit, and 20% cited both increasing support for and dependence on the vaccine-developing country as motivations.

While many citizens already thought the distribution of vaccines was motivated by global public health considerations, the personal experience of receiving a particular vaccine strengthened this perception. Using equation (1) to estimate the effect of reporting having received a vaccine devel-

Table 3: The pooled effect of individuals receiving a particular vaccine on the perceived motivation of government of the country where the vaccine was developed for distributing vaccines

	Stop COVID-19 spread (1)	**Help respondent country** (2)	**Increase support for sender** (3)	**Increase dependence on sender** (4)	**Obtain economic profits** (5)
Country developed vaccine	0.043*	0.015	0.060***	-0.029	-0.005
	(0.022)	(0.021)	(0.020)	(0.019)	(0.020)
R^2	0.14	0.06	0.06	0.13	0.10
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Control outcome mean	0.48	0.19	0.20	0.20	0.37
Control outcome std. dev.	0.50	0.39	0.40	0.40	0.48
Country developed vaccine mean	0.34	0.34	0.34	0.34	0.34
Number of fixed effects	65	65	65	65	65
Observations	1,954	1,954	1,954	1,954	1,954

Notes: Each specification includes eligibility group × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment baseline survey trust, and is estimated using OLS. Eligibility groups are defined in Appendix Table A3. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

oped in a particular country on the likelihood that a respondent attributed a given motivation to the government of that country, column (1) of Table 3 shows that respondents became 4.3 percentage points, or almost 10%, more likely to believe that the government of the country that developed their vaccine was pursuing the common public good of preventing the spread of COVID-19. This finding suggests that personally receiving a vaccine increased citizen trust in a foreign government by favorably updating a citizen's belief that the foreign power was pursuing shared or humanitarian objectives, and may continue to do so in the future.

Interestingly, vaccine recipients did not view vaccine provision as entirely altruistic, becoming more cynical as well. Column (3) shows that respondents became 6 percentage points more likely to believe that the government of the country which they believed developed their vaccine had distributed vaccines in order to increase their support abroad. Perceptions of the most cynical motivations in columns (4) and (5)—increasing dependence or economic profit—decreased somewhat, but not significantly so. The positive overall effect of personally receiving a vaccine on trust in

foreign governments suggests that favorable updating regarding the public goods motivation overpowered respondents' greater cynicism. Our analysis of aggregate COVID-19 vaccine distribution, to which we next turn, further illustrates how the number of vaccines received shapes the relative importance of these mechanisms.

6 Learning about aggregate vaccine distribution

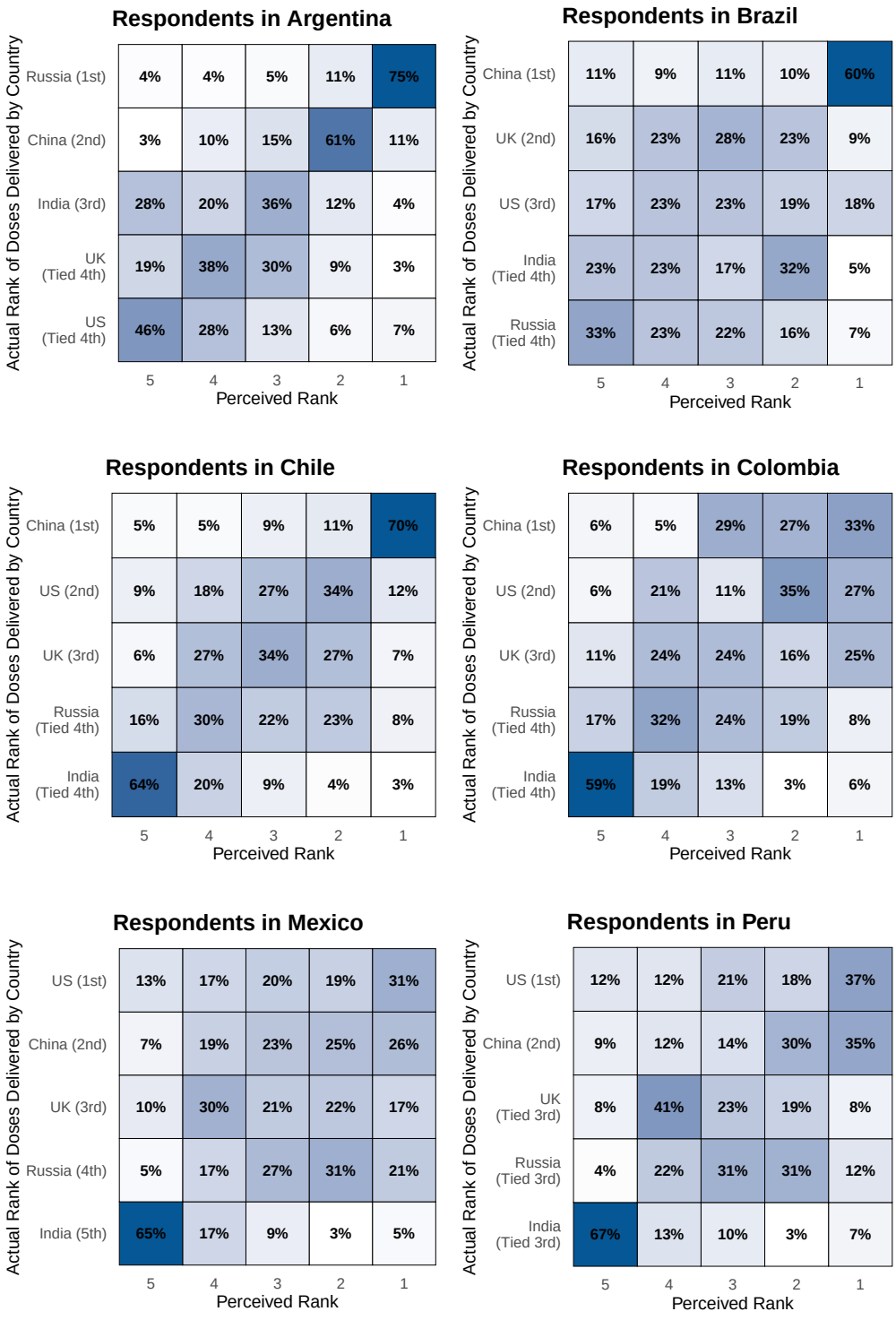
While individuals exhibit durably greater trust in the country where they believe the vaccine they personally received was developed, trust in foreign governments might also respond to information about the share of individuals *across one's entire country* that received a vaccine developed in that foreign country. H2 suggests that aggregate information may also signal a foreign power's motives, and in turn affect whether citizens expect that government to act in ways that may benefit the respondent's country and its citizens in the future.

6.1 Experimental design

We embedded an experiment in our May 2021 endline survey to evaluate the effect of informing citizens about the share of vaccine doses each country had received from the different vaccine-developer countries. Following a large literature examining the effects of information provision in other politically-salient domains (e.g. Dunning et al., 2019), our goal was to understand how truthful information of the type that the media, foreign governments, and domestic leaders publicize—and its relation to their prior beliefs—shapes trust in foreign governments.

As Figure 2 shows, the experiment commenced toward the end of the survey by eliciting respondents' prior beliefs. All respondents—regardless of their vaccination status—were asked to rank China, India, Russia, the UK, and the US in order of which country they believed had developed the most and least of the vaccines available in the respondent's country. We focus on the ranking to reduce the cognitive burden of the task. Restricting to respondents who did not indicate

Figure 5: Perceived and actual ranking of doses delivered by each vaccine developer country in each country surveyed.



Notes: The heat maps show the share of respondents ranking a vaccine-developer country in each ranking position, by respondent country, against the actual ranks. The percentages in each row indicate the share of respondents who assigned a given rank to that country. The darker the squares along the diagonal, the more accurate were the perceived rankings.

the same ranking for multiple countries,[21] the greater mass of respondents along the diagonals in the heat maps in Figure 5 shows that respondents' prior beliefs were broadly aligned with the true ranking. This was most true for the top-ranked and bottom-ranked vaccine-developing countries, although there remained scope to correct many respondents' beliefs.

Treated individuals were then shown a bar chart reporting the actual ranking and percentage of vaccines that their country had received from each vaccine-developing country by May 2021. We counted all vaccines administered, including from bilateral sales delivered by pharmaceutical firms and COVAX donations by foreign governments. The example for Argentina in Figure 6 illustrates the clear and simple way in which this information was conveyed. This treatment was randomly assigned within blocks of similar individuals,[22] with control respondents receiving no information. All respondents were then asked the same trust in foreign governments question used in our observational analysis, before being asked about their perceptions of the intentions of the three foreign countries where most vaccines in their country were developed.

We estimate average treatment effects of providing information about aggregate vaccine distribution, again pooling across vaccine-developer countries, using the following OLS regression:

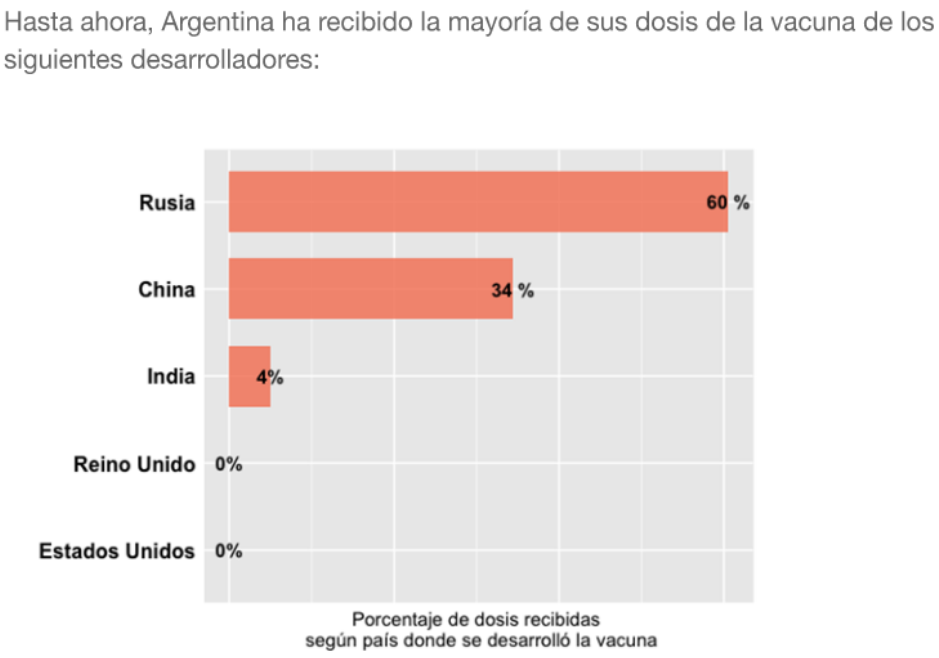
$$Trust_{dic} = \alpha_{dbc} + \sum_{r} \beta_{dr} \mathbb{1}[Prior\ trust_{dic} = r] + \tau\, Treated_{ic} + \varepsilon_{dic}, \tag{2}$$

where $Prior\ trust_{dic}$ flexibly adjusts for the measure of trust from earlier in the endline survey to increase estimation precision, and α_{dbc} are foreign government-specific fixed effects for each randomization block b within respondent country c. Reflecting the level of treatment assignment, robust standard errors are clustered by individual respondent. Appendix Table A9 uses the same specification to show that treatment is well-balanced across predetermined covariates in the baseline and endline surveys; consistent with chance, only 8 of 101 predetermined—which include 15 responses from earlier in the endline survey, including the vaccine (if any) that a respondent

[21] Tables A12 and A13 demonstrate that the experimental results are robust to removing this restriction.

[22] Blocks were created based on earlier survey responses (having received a vaccine, regarding themselves as eligible for a vaccine, and frequently discussing COVID-19), the date on which they took the survey, and the respondent's country.

Figure 6: Screenshot of the information treatment (from Argentina)



Notes: In English, the text reads "Until now, Argentina has received the majority of its vaccine doses from the following developers." The *x* axis title is "Percentage of doses received by the country that developed the vaccine"; from most to least, the countries listed in the Argentina example are Russia, China, India, the UK, and the US.

received—covariates differ at the 10% significance level.

However, the information content varied by foreign power and respondent country. Since respondents' prior beliefs broadly aligned with the true ranking *on average*, the effect of the information treatment is likely to depend on whether the reported rank of country d is high or low and falls above or below a respondent's expectations. Following prior research using informational interventions, H2 anticipates treatment effects to be driven by the reported rank of each developer country, the share of doses that each developer country contributed, and whether the rank met or exceeded a respondent's prior belief.[23] We estimate these heterogeneous effects using the following interactive

[23]We pool cases that met and exceeded expectations because reinforcing priors beliefs—especially regarding the top-ranked vaccine-developer country that could not have been ranked higher—could cement the baseline levels of trust in the foreign governments under consideration.

OLS specification:

$$Trust_{dic} = \alpha_{dbc} + \sum_{r} \beta_{dr} \mathbb{1}[Prior\ trust_{dic} = r] + \gamma X_{dc} + \tau_0\, Treated_{ic} + \tau_2 (Treated_{ic} \times X_{dc}) + \varepsilon_{dic}, \quad (3)$$

where X_{dc} captures the rank or share of vaccine-developing country d or an indicator for reported rank being at least as high as a respondent's prior belief. The ranking variable is reversed, so higher scores indicate greater vaccine distribution, i.e., 5 corresponds to 1st and 1 corresponds to 5th.

6.2 Results

We report the average treatment effects in panel A of Tables 4 and 5, which respectively consider our ordinal and binary trust outcomes. Column (1) indicates that the informational treatment only slightly increased trust in the average developer country by 0.03 levels (or 0.03 standard deviations) on the four-point trust scale and by 2 percentage points for our binary measure. Neither small, but precisely estimated, effect is statistically significant at the 5% level. This indicates that the average citizen's prior belief largely aligned with the information provided, or that any positive and negative responses across vaccine-developing countries netted out. Suggesting that the second interpretation partly explains the limited effect on trust in the average foreign power, the by-country results in columns (2)-(6) show that the average effects are largely driven by an increase in trust in the Chinese government of 0.16 levels, or almost 0.2 standard deviations. The US—the second largest vaccine-developer—also registered an increase in trust of around half this size for the average respondent. At the time of the survey, few vaccines developed in India or the UK had been administered in any respondent country.

We further investigate whether respondents are learning from the information provided by examining heterogeneity in response to the treatment's *content*. Pooling across vaccine-developer countries and using linearized moderators, column (1) in panel B of Table 4 shows that each unit increase in the five-country ranking—such as going from second to first largest sender—increased the effect of treatment on trust by 0.06 levels, while panel C shows that a 20 percentage point in-

Table 4: The effect of aggregate vaccine distribution information treatment on trust in foreign governments, outcome scale

	Outcome: trust in foreign government scale					
	Pooling all governments (1)	Chinese government (2)	Indian government (3)	Russian government (4)	UK government (5)	US government (6)
Panel A: Average treatment effect						
Treated	0.034*	0.155***	-0.002	-0.015	-0.009	0.040
	(0.020)	(0.032)	(0.031)	(0.031)	(0.029)	(0.032)
R^2	0.57	0.55	0.43	0.58	0.53	0.56
Panel B: Heterogeneity by rank of vaccines received by the respondent's country						
Treated × Reversed rank	0.056***	0.172***	0.039	0.046**	0.020	0.065**
	(0.009)	(0.064)	(0.044)	(0.022)	(0.038)	(0.025)
R^2	0.57	0.55	0.43	0.58	0.53	0.56
Reversed rank range	[1,5]	[4,5]	[1,3]	[1.5,5]	[1.5,4]	[1.5,5]
Reversed rank mean	3.00	4.55	1.74	2.27	2.77	3.67
Reversed rank std. dev.	1.37	0.50	0.65	1.30	0.77	1.20
Panel C: Heterogeneity by the share of vaccines received by the respondent's country						
Treated × Share	0.271***	0.396***	1.452	0.257**	-0.105	0.168
	(0.045)	(0.127)	(1.817)	(0.129)	(0.207)	(0.117)
R^2	0.57	0.55	0.43	0.58	0.53	0.56
Share range	[0,0.85]	[0.14,0.84]	[0,0.04]	[0,0.60]	[0,0.44]	[0,0.85]
Share mean	0.19	0.53	0.01	0.12	0.09	0.23
Share std. dev.	0.27	0.25	0.02	0.23	0.15	0.26
Panel D: Heterogeneity by rank of vaccines received by the respondent's country relative to prior belief						
Treated × Reversed rank ≥ Reversed prior	0.115***	0.075	0.132**	0.055	0.044	0.119
	(0.030)	(0.100)	(0.064)	(0.064)	(0.060)	(0.075)
R^2	0.57	0.55	0.44	0.58	0.53	0.56
Reversed rank ≥ Reversed prior range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Reversed rank ≥ Reversed prior mean	0.63	0.87	0.57	0.38	0.56	0.75
Reversed rank ≥ Reversed prior std. dev.	0.48	0.33	0.49	0.48	0.50	0.43
Panel E: Heterogeneity by rank of vaccines received by the respondent's country and prior beliefs						
Treated × Reversed rank	0.054***	0.143**	0.061	0.048*	0.019	0.053**
	(0.010)	(0.066)	(0.045)	(0.025)	(0.038)	(0.026)
Treated × Reversed prior	0.006	0.061**	-0.061***	-0.006	0.007	0.038*
	(0.011)	(0.026)	(0.023)	(0.024)	(0.024)	(0.022)
R^2	0.57	0.55	0.44	0.58	0.53	0.56
Reversed prior range	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]
Reversed prior mean	3.09	3.88	2.23	3.23	2.96	3.14
Reversed prior std. dev.	1.50	1.34	1.45	1.45	1.31	1.46
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}
Control outcome mean	2.50	2.20	2.14	2.56	2.81	2.79
Control outcome std. dev.	0.94	0.94	0.84	0.95	0.84	0.93
Observations	8,245	1,649	1,649	1,649	1,649	1,649

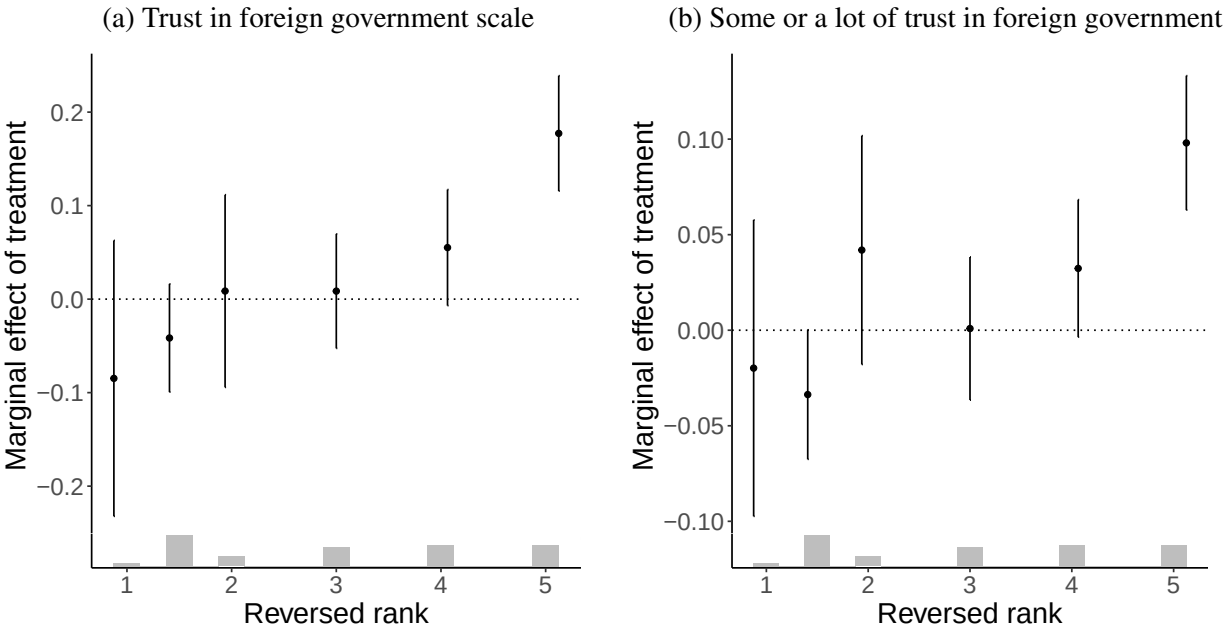
Notes: The specification in each column of each panel includes experimental block × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects and country-specific indicators for each level of pre-treatment endline survey trust, and is estimated using OLS. Covariates and the lower-order interaction terms in panels B-E are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: The effect of aggregate vaccine distribution information treatment on trust in foreign governments, binary outcome

	Outcome: some or a lot of trust in foreign government indicator					
	Pooling all governments (1)	Chinese government (2)	Indian government (3)	Russian government (4)	UK government (5)	US government (6)
Panel A: Average treatment effect						
Treated	0.020*	0.087***	-0.011	-0.005	-0.008	0.035**
	(0.011)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
R^2	0.48	0.43	0.35	0.47	0.46	0.47
Panel B: Heterogeneity by rank of vaccines received by the respondent's country						
Treated × Reversed rank	0.031***	0.090**	0.009	0.007	0.016	0.046***
	(0.005)	(0.037)	(0.028)	(0.014)	(0.023)	(0.014)
R^2	0.48	0.43	0.35	0.47	0.46	0.47
Reversed rank range	[1,5]	[4,5]	[1,3]	[1.5,5]	[1.5,4]	[1.5,5]
Reversed rank mean	3.00	4.55	1.74	2.27	2.77	3.67
Reversed rank std. dev.	1.37	0.50	0.65	1.30	0.77	1.20
Panel C: Heterogeneity by the share of vaccines received by the respondent's country						
Treated × Share	0.150***	0.174**	0.488	0.027	-0.021	0.176***
	(0.026)	(0.074)	(1.202)	(0.079)	(0.124)	(0.066)
R^2	0.48	0.43	0.35	0.47	0.46	0.47
Share range	[0,0.85]	[0.14,0.84]	[0,0.04]	[0,0.6]	[0,0.44]	[0,0.85]
Share mean	0.19	0.53	0.01	0.12	0.09	0.23
Share std. dev.	0.27	0.25	0.02	0.23	0.15	0.26
Panel D: Heterogeneity by rank of vaccines received by the respondent's country relative to prior belief						
Treated × Reversed rank ≥ Reversed prior	0.067***	0.057	0.058	0.030	0.049	0.053
	(0.017)	(0.057)	(0.038)	(0.037)	(0.037)	(0.042)
R^2	0.48	0.43	0.35	0.47	0.46	0.47
Reversed rank ≥ Reversed prior range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Reversed rank ≥ Reversed prior mean	0.63	0.87	0.57	0.38	0.56	0.75
Reversed rank ≥ Reversed prior std. dev.	0.48	0.33	0.49	0.48	0.50	0.43
Panel E: Heterogeneity by rank of vaccines received by the respondent's country and prior beliefs						
Treated × Reversed rank	0.030***	0.078**	0.018	0.010	0.019	0.038**
	(0.006)	(0.038)	(0.029)	(0.015)	(0.024)	(0.015)
Treated × Reversed prior	0.001	0.025*	-0.021	-0.009	-0.012	0.023*
	(0.006)	(0.015)	(0.013)	(0.014)	(0.014)	(0.012)
R^2	0.48	0.43	0.35	0.48	0.46	0.48
Reversed prior range	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]
Reversed prior mean	3.09	3.88	2.23	3.23	2.96	3.14
Reversed prior std. dev.	1.50	1.34	1.45	1.45	1.31	1.46
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Control outcome mean	0.47	0.35	0.28	0.50	0.63	0.62
Control outcome std. dev.	0.50	0.48	0.45	0.50	0.48	0.49
Observations	8,245	1,649	1,649	1,649	1,649	1,649

Notes: The specification in each column of each panel includes experimental block × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects and country-specific indicators for each level of pre-treatment endline survey trust, and is estimated using OLS. Covariates and the lower-order interaction terms in panels B-E are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 7: Moderation of the effect of the aggregate vaccine distribution information treatment on trust in foreign governments, by vaccine-developer country rank



Notes: Each line is the 95% confidence interval for each conditional average treatment effect, estimated using a non-parametric set of interaction terms in equation (3). The bars at the foot of each plot indicate the distribution across reported ranks.

crease in the share of vaccines developed in a given country increased trust by a similar amount.[24] Turning to our binary outcome, Table 5 indicates that each unit rank improvement increased the probability of trusting a foreign government by 3 percentage points and a 20 percentage increase in the share of vaccines developed in a given country also increased trust by a similar amount.

The marginal effects of the reported ranking on each trust outcome are plotted non-parametrically in Figure 7. These estimates show that treatment significantly increased trust in the governments of the top two vaccine-developing countries, and reduced it somewhat for the country that distributed fewest vaccines. The effects increase fairly linearly with reported rank.

Moreover, panel D compares treatment effects across the 63% of respondents who were encouraged to update positively about a country's rank or had their prior beliefs confirmed (increasing their certainty in a belief) and the 37% of respondents who were encouraged to update negatively. The

[24] Appendix Tables A10 and A11 show that these estimates are broadly similar in each respondent country, except in Perú where responses to treatment were weaker.

former group significantly increased their trust in the average foreign government by 0.12 more levels and became 7 percentage points more likely to trust a foreign government than the latter group. Treatment effects are thus driven by respondents who did not update unfavorably about the delivery of vaccines developed in a foreign country.

Together, these results suggest that information about the mass distribution of COVID-19 vaccines can also cultivate trust in foreign powers within Latin America. Columns (2)-(6) of panels B and C find that respondents were generally most sensitive to being informed about vaccines developed in China, Russia, and the US—the three countries from which most vaccines in the region at the time had originated.

While our findings are consistent with respondents learning from the information provided in the treatment, it remains possible that the information instead primed reactions to pre-existing beliefs (e.g. Iyengar and Simon, 2000). If this were the case, individuals who already believed a country had sent more vaccines should respond most to treatment. To help distinguish between the learning and priming interpretations, panel E examines effect heterogeneity with respect to the reported rank and respondent prior belief simultaneously. The moderating effect loads largely on the reported ranking, suggesting that treatment effects are principally driven by learning, rather than priming.

The preceding results are robust across various alternative specifications reported in Appendix Tables A12 and A13. First, ensuring that chance covariate imbalances are not driving the results, we find similar estimates when adjusting for the 8 predetermined covariates over which treatment is imbalanced. Second, the results are robust to including only respondents whose prior beliefs produced a set of rankings that were unique for each vaccine-developing country. Third, our findings are robust to estimating treatment effects using ordered logit or logit models for our scale and binary trust outcomes. Finally, the effects detected in our sample appear to generalize to the broader population: applying rake weights, we observe similar effect magnitudes to our unweighted results.

Table 6: The effect of the aggregate vaccine distribution information treatment on the perceived motivation of government of the country where the vaccine was developed for distributing vaccines

	Stop COVID-19 spread (1)	**Help respondent country** (2)	**Increase support for sender** (3)	**Increase dependence on sender** (4)	**Obtain economic profits** (5)
Treated	-0.091*	0.004	0.080	0.008	-0.010
	(0.052)	(0.045)	(0.049)	(0.042)	(0.048)
Treated × Reversed rank	0.024**	0.003	-0.019*	0.007	-0.005
	(0.012)	(0.011)	(0.012)	(0.011)	(0.011)
R^2	0.14	0.07	0.05	0.12	0.13
Reversed rank range	[2,5]	[2,5]	[2,5]	[2,5]	[2,5]
Reversed rank mean	3.97	3.97	3.97	3.97	3.97
Reversed rank std. dev.	0.87	0.87	0.87	0.87	0.87
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Control outcome mean	0.44	0.18	0.19	0.18	0.42
Control outcome std. dev.	0.50	0.38	0.39	0.38	0.49
Observations	4,934	4,934	4,934	4,934	4,934

Notes: The specification in each column includes experimental block × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment endline survey trust, and is estimated using OLS. Covariates and lower-order interaction terms are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

6.3 Potential mechanisms

To probe the mechanisms underlying the effects of providing aggregate information about where different vaccines were developed, we first follow our previous approach of examining changes in beliefs about a foreign government's motivations for providing COVID-19 vaccines. We then further examine whether the treatment is primarily changing trust among respondents who are less cynical about a foreign power's reasons for developing COVID-19 vaccines.

The changes in respondent perceptions about country motives are broadly in line with H3, suggesting that similar mechanisms drive respondent updating from aggregate information as personal receipt of a specific vaccine. Column (1) of Table 6 shows that the effect of treatment on the perception that a foreign government is preventing the spread of COVID-19 is significantly greater

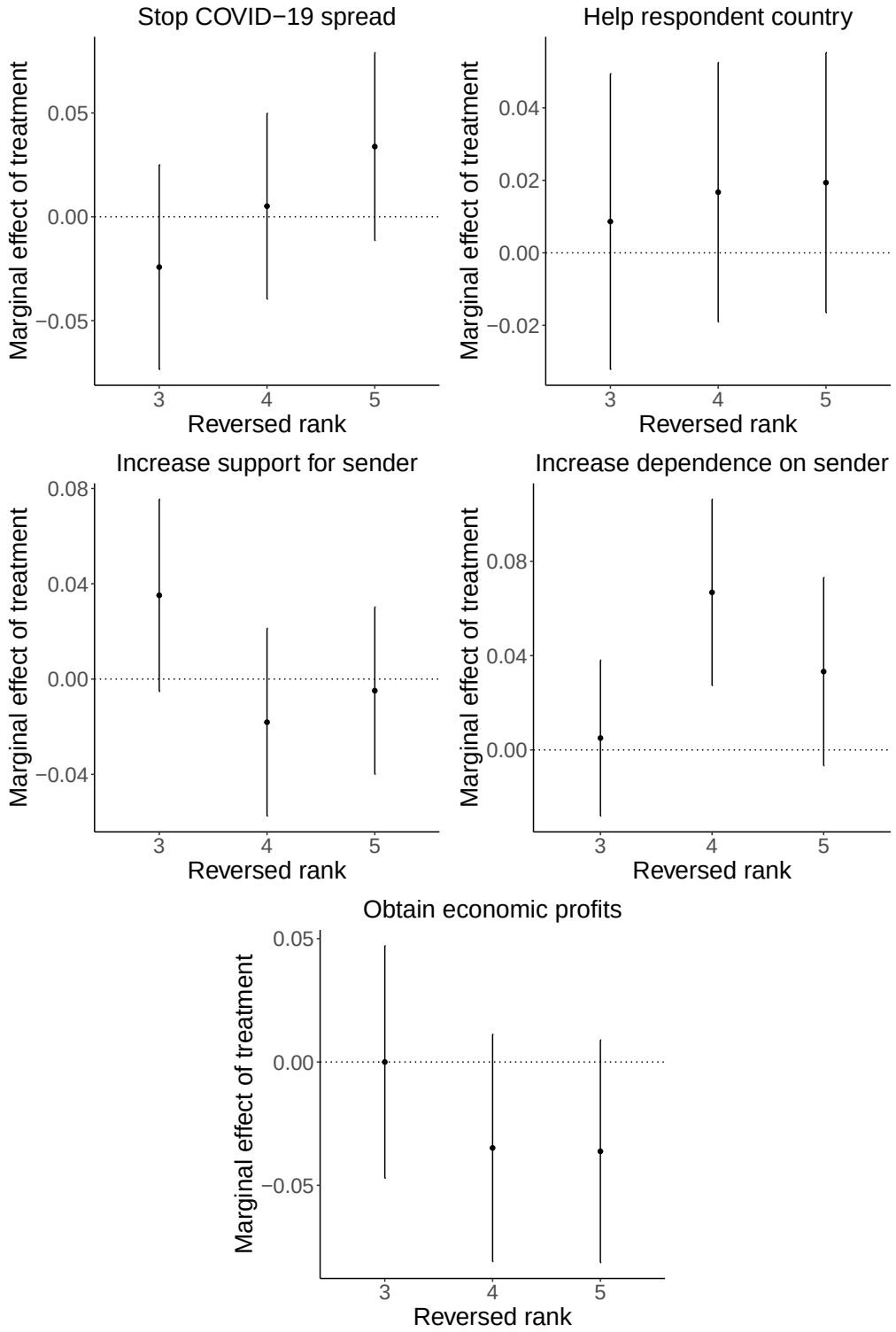
for the highest-ranked vaccine-developer countries. As Figure 8 shows non-parametrically, moving from the middle to the highest rank implies a 5 percentage point increase in the probability that a respondent believed that a foreign government's vaccine diplomacy was motivated by pursuing a global public good. This again provides a clear rationale for citizens updating the extent to which they trust a foreign government.

As with our analysis of personally receiving a particular vaccine and Rhee, Crabtree and Horiuchi's (2023) analysis of US citizens' attitudes toward Russian vaccine donations, column (3) of Table 6 shows that treated respondents also became more likely to attribute strategic motivations to vaccine-developer countries. In contrast with the public goods motivation, however, the countries from which more vaccines came were more immune to cynical updating: the interaction term in column (3) and the non-parametric results in Figure 8 indicate that respondents were less likely to believe that foreign governments of these countries were motivated by increasing their international support.

These results again show that vaccine distribution increased perceptions of both public good and cynical motivations, with the former increasingly outweighing the latter when a country received more vaccines developed in a particular foreign country, thus yielding a net positive effect on trust. This feature of receiving information about the aggregate distribution may help to explain why the effect of providing aggregate information for the top-ranked countries—where the public good motivation far outweighs cynicism—exceeds the average effect of personally receiving a particular vaccine.

To further probe whether perceptions of a public goods motivation drive increased trust in foreign governments, a second mechanism test compares treatment effects on trust across respondents who primarily viewed a given country's vaccine distribution as motivated by sincere interest in the greater public good and those who attributed more cynical reasons for vaccine provision. The former group is defined by respondents who listed at least as many public good-oriented motivations (i.e., stopping the spread of COVID-19 and helping the respondent's country) as cynical motivations (i.e., increasing support for the sender, increasing dependence on the sender, or eco-

Figure 8: Moderation of the effect of the aggregate vaccine distribution information on the perceived motivation of government of the country where the vaccine was developed for distributing vaccines, by vaccine-developer country rank



Note: Each line is the 95% confidence interval for each conditional average treatment effect, estimated using a non-parametric set of interaction terms in equation (3).

Table 7: The pooled effect of the aggregate vaccine distribution information treatment on trust in foreign governments across public good-oriented and cynical respondents, outcome scale

	Outcome: trust in foreign government scale				
	(1)	(2)	(3)	(4)	(5)
Panel A: Respondents perceiving primarily public good motivations					
Treated	0.085***	-0.248**	0.007	-0.031	-0.249**
	(0.025)	(0.113)	(0.038)	(0.054)	(0.119)
Treated × Reversed rank		0.085***			0.085***
		(0.028)			(0.029)
Treated × Share			0.243***		
			(0.087)		
Treated × Reversed rank ≥ reversed prior				0.151**	
				(0.061)	
Treated × Reversed prior					0.000
					(0.019)
R^2	0.52	0.52	0.52	0.52	0.52
Control outcome mean	2.86	2.86	2.86	2.86	2.86
Control outcome std. dev.	0.85	0.85	0.85	0.85	0.85
Moderator range		[2,5]	[0,0.85]	{0,1}	[2,5], [1,5]
Moderator mean		3.94	0.32	0.77	3.94, 3.50
Moderator std. dev		0.89	0.25	0.42	0.89, 1.40
Observations	2,446	2,446	2,446	2,446	2,446
Panel B: Respondents primarily perceiving cynical motivations					
Treated	0.070***	-0.134	0.025	0.074	-0.213
	(0.026)	(0.132)	(0.039)	(0.061)	(0.133)
Treated × Reversed rank		0.051			0.027
		(0.032)			(0.035)
Treated × Share			0.145		
			(0.091)		
Treated × Reversed rank ≥ reversed prior				-0.005	
				(0.068)	
Treated × Reversed prior					0.051**
					(0.021)
R^2	0.57	0.58	0.58	0.58	0.58
Control outcome mean	2.20	2.20	2.20	2.20	2.20
Control outcome std. dev.	0.94	0.94	0.94	0.94	0.94
Moderator range		[2,5]	[0,0.85]	{0,1}	[2,5], [1,5]
Moderator mean		3.99	0.31	0.80	3.99, 3.43
Moderator std. dev.		0.85	0.29	0.40	0.85, 1.41
Observations	2,488	2,488	2,488	2,488	2,488
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}

Notes: The specification in each column of each panel includes experimental block × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment endline survey trust, and is estimated using OLS. The respondents in panel A listed at least as many public good motivations as cynical motivations regarding the vaccines developed in a given foreign country; panel B is the complementary group. Moderator descriptive statistics in column 5 reflect reversed rank and reversed prior, respectively. Covariates are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

nomic profit) for a given country ranked among the top three vaccine distributors; the latter group is defined conversely. These comparisons should, however, be treated with caution because the subgroups are themselves affected by treatment.[25]

Furthermore, column (1) of panels A and B in Table 7 shows that primarily cynical respondents experienced slightly lower increases in trust in response to the treatment on average, although trust in foreign powers significantly increased in each subgroup. However, our heterogeneous effects provide stronger support for H3: panel A indicates that respondents primarily perceiving public good motivations were highly responsive to the number of vaccines that their country received from vaccine-developer countries and whether the ranking exceeded prior expectations; in contrast, treatment may have primed the prior beliefs of primarily cynical respondents, but their levels of trust did not respond to the information provided.[26] This evidence suggests that citizen trust in foreign governments is driven by perceived public good motivations.

7 Conclusion

Focusing on six major countries in Latin America, we leverage observational and experimental research designs to demonstrate that COVID-19 vaccine distribution can significantly increase trust in the governments of vaccine-developing countries. Personally receiving a vaccine increased trust in the country that produced that vaccine by about 0.2 standard deviations, relative to individuals who believed their vaccine was developed by a different country. Informing respondents that their country received the most, as opposed to the least, vaccines from a particular country also increased their immediate probability of trusting that country's government by 12 percentage points. The effect of each mode of experiencing vaccine diplomacy is principally driven by citizens becoming more likely to perceive foreign governments as pursuing an important public good.

As other scholars have noted, trust is a valuable resource in foreign policy. Our results suggest that delivery of widely-publicized and efficacious vaccines to other countries can be a productive

[25]The results in Table 6 indicate that conditioning on these post-treatment perceptions could generate biases that are hard to sign (Montgomery, Nyhan and Torres, 2018).

[26]Appendix Table A14 reports similar results for our binary trust outcome.

way for vaccine-developing countries to generate trust abroad, much like foreign aid and diplomatic visits. Our findings align, both in the magnitude of our estimates and their underlying mechanisms, with studies in other regions that suggest that the provision of appropriate and in-demand aid increases the favorability of public opinion toward the foreign state in contexts where mass attitudes are malleable (e.g. Carreras, Visconti and Acácio, 2021; Goldsmith, Horiuchi and Wood, 2014).[27] Given the scale of global demand for vaccines, for COVID-19 and other current and future diseases, vaccine diplomacy has the potential to play a major role in improving trust in vaccine-producing countries *and* in helping foreign powers realize their agendas. For instance, following receipt of Chinese vaccines, countries like Honduras and Paraguay began to reconsider their ties with Taiwan, a policy change facilitated by an increase in domestic publics' trust in China.[28]

While these anecdotes speculate about the downstream effects of the trust that vaccine diplomacy may cultivate, an important next step in this research agenda is to identify whether shifts in public opinion toward a foreign country actually affect the foreign policy behavior of vaccine recipient countries, such as the ratification of treaties and construction of military bases. Great powers' vaccine distribution to nations around the world suggests that leaders believe it will. China has distributed shots to both strategic partners in the Belt and Road Initiative (BRI) and also to non-allied countries in Africa, Asia, and the Middle East, all with an eye toward enhancing trust and advancing their geopolitical objectives (Huang, 2021; Ridwan, 2022). Because the most significant consequences of changes to foreign trust are likely to materialize gradually, such phenomena will need to be studied over the coming years.

It will also be important to examine whether the documented changes in public opinion persist as the pandemic evolves. First, public opinion may respond to the changing efficacy of vaccines. At the time of our study, all of the vaccines of different national origin were perceived to be highly effective against severe disease, albeit varying in effectiveness against mild illness. These percep-

[27]The number of prospective individual beneficiaries of vaccine campaigns is large. This differentiates vaccine diplomacy from many other forms of foreign aid, public diplomacy, or trade policy in which individual benefits are difficult to infer (Mansfield and Mutz, 2009).

[28]On Honduras, see: "Taiwan says China seeking political gain with Honduras vaccine move," Reuters, 05/12/2021; On Paraguay, see: "Paraguay's 'Life and Death' Covid Crisis Gives China Diplomatic Opening," *New York Times*, 4/16/2021.

tions have changed somewhat in light of subsequent virus mutations. Since an important foreign policy literature argues that individuals form their opinions of and support for foreign policy based on a policy's effectiveness (Eichenberg, 2005; Sagan and Valentino, 2017), future research should investigate how shifts in vaccine efficacy may moderate the effects of vaccine diplomacy on the cultivation of reputational benefits for vaccine-sending countries. Second, research should eventually assess whether trust in foreign governments shaped by vaccine diplomacy endures as the pandemic recedes. Regardless of its durability, epidemics are likely to become more common and vaccines—long a part of the diplomatic repertoire (Huang, 2021)—are likely to remain salient in our era of global interdependence (Fazal, 2020). There is thus reason to anticipate that our findings will remain relevant to foreign statecraft beyond the current health crisis. Third, it is important to establish whether our findings extend beyond Latin America, particularly to parts of the world that started to receive vaccines later. The countries in our sample varied significantly in their historical and contemporary experiences with great power competition, which suggests that our results may travel to other parts of the Global South with similarly varied exposure to foreign intervention and public diplomacy. The size of the effects and extent of citizens' updating will likely differ depending on prior exposure to great powers and citizens' perceptions of the powers' motivations for foreign assistance. Greater proximity to or alignment with Chinese or Russian intervention, in particular, may produce different mass attitudinal responses to their soft power campaigns.

Another area of inquiry ripe for future research is the elite-level geopolitics of vaccine distribution. Our article focused on citizens' responses to the receipt of COVID-19 vaccines, exploiting within-country variation in which vaccine and the information that an individual receives about vaccine distribution in their country. However, we take as given the aggregate patterns of vaccine distribution. The international relations field would benefit from a more comprehensive understanding of the politics of vaccine distribution: where, when, and why vaccines are being sent and why. Intriguingly, our findings indicate that countries—particularly China, which has until recently maintained a limited foothold in Latin America—may be able to increase their soft power resources in regions far beyond their traditional geopolitical spheres of influence.

Finally, our study's policy implication aligns with that of Goldsmith, Horiuchi and Wood (2014): states can "do well by doing good." The distribution of vaccines is not just the right thing to do for normative reasons of equity, humanitarian reasons of global health, and national strategic reasons of ending a pandemic that knows no borders—it can also serve geopolitical goals. For such soft power currencies to materialize, our findings suggest that states likely need to distribute large quantities of COVID-19 vaccines in relative as well as absolute terms, gaining a top place in recipient states' vaccine arsenals. Our findings further indicate that information about and publicity of vaccine diplomatic efforts proves critical, consistent with the foreign policy literature on elite communication and cues. To have their greatest impact on global hearts and minds, countries may wish to specifically brand the motivations behind these efforts to convey their altruism and generosity.

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A.1 Overview of vaccine rollouts in Latin America

While private companies undoubtedly played a key role in the production and distribution of vaccines, particular COVID-19 vaccines are strongly associated with their country of origin. Indeed, governments played a pivotal role in developing the vaccines: the US government, for example, provided between $6 and $10 billion in funding for vaccine research;[1] the UK government made the largest contribution to the predominantly publicly-funded AstraZeneca vaccine;[2] in China and Russia, state-controlled institutes and enterprises have produced vaccines. The governments of these great power have also played an important role in facilitating vaccine acquisition contracts between non-producer governments and private vaccine producers;[3] given the initially limited supply of vaccines available to the Global South, contracts to acquire high-quality vaccines were particularly prized. Moreover, their leaders have actively engaged in credit-claiming for the development and global distribution of vaccines. The US Embassies in Colombia and El Salvador, for example, broadcast bilateral donations of US-produced doses to both countries.[4] Accordingly, vaccine-developing states are likely to receive credit for their significant investments in the development and global distribution of the vaccines produced in their country.

Rollout of vaccines across our cases generally prioritized vaccine delivery to healthcare workers and workers on the front-lines, elderly populations, and populations at-risk due to prior medical conditions. Figure 1 in the main paper shows the cumulative administration of vaccine doses per 100 residents in our six countries of interest. We next provide further information about the specific rollout in each of the countries in our study.

A.1.1 Argentina

Argentina began COVID-19 vaccinations on December 29, 2020. The federal government defined the first eligible groups in a national vaccination group that prioritized first individuals based on risk exposure and by age. Argentina started vaccinating healthcare personnel, followed by adults 70 years of age and older, then adults 60 to 69 years of age, then security personnel and prison workers, then adults 18 to 59 years of age with risk factors, and finally teachers and other staff in educational institutions. In practice, eligibility on any given week was defined by states, which would announce who from each prioritized group was eligible on a specific date.

The Argentine government officially stated that individuals would not be able to select which vaccine they received, emphasizing that vaccines would be given based on availability and that all vaccines approved in Argentina were safe and efficacious.[5]

A.1.2 Brazil

Brazil began COVID-19 vaccinations on January 18, 2021, starting with the Sinovac vaccine and followed by the AstraZeneca vaccine. The federal government delineated a vaccination calendar for the country based on type of employment, age, and comorbidities. The national-level plan consisted of four rollout stages, beginning with healthcare workers, senior citizens over the age of 75, senior citizens over 60 in long-term care facilities, and indigenous communities; the second stage included citizens between 60 to 74 years of age; the third stage opened up vaccination to people with risk factors; and the fourth stage before the general

[1] Estimates from "For Billion-Dollar COVID Vaccines, Basic Government-Funded Science Laid the Groundwork," *Scientific American*, 11/08/2020, and "Domestic Funding for COVID-19 Vaccines:An Overview," *Congressional Research Service*, 03/29/2021.

[2] "Oxford/AstraZeneca Covid vaccine research 'was 97% publicly funded'," *Guardian*, 4/15/2021.

[3] COVID-19 Vaccine Access, Global Health Center 2021, retrieved on 1/31/2022

[4] See Embajada EEUU Colombia, 2022 and Embajada EEUU El Salvador, 2022.

[5] See Sociedad Argentina de la Vacunología y Epidemiología (2021).

population included teachers, police and other security workers, inmates and people working in prisons. In practice, municipalities announced schedules for who was eligible for vaccination on any given week and this varied somewhat from municipality to municipality. For instance, municipalities could announce that on the next Monday, only 74 year olds were being vaccinated and on Tuesday, only 73 year olds and so on. For the same week, another municipality could announce that on Monday 74 and 73 year olds were to be vaccinated. Overall, however, municipalities did vaccinate within the same eligibility groups on the same months.

A.1.3 Chile

Chile began COVID-19 vaccinations for health-care workers on December 24, 2020. Eligibility was coordinated at the national level, and prioritized groups for vaccination on the basis of age, medical vulnerability, and occupation. The Chilean vaccination campaign began by vaccinating healthcare workers on December 24, 2020. Age-based eligibility began on February 3, 2021, moving from 90+ years of age and adding additional age cohorts each day. Profession-based vaccination began on February 15, 2021, with educators over 60 becoming eligible. Beginning March 14, 2021, adults with co-morbid medical conditions started to become eligible, starting with 59 year old adults and adding additional age cohorts each day. All adults 17 years and older became eligible for their first dose in Chile by July 2, 2021.

Both internal reports, by the Chilean Health Ministry, and external evaluations, by the World Bank, emphasize the programmatic implementation of Chile's vaccination program, in which individuals were assigned to specific, narrow date ranges for vaccination based on eligibility criteria, and within these days were allowed to select their vaccination site within their municipality. Neither World Bank nor Chilean government program evaluations mention the ability of individuals to select which vaccine they received, with doses applied based purely on supply.[6]

A.1.4 Colombia

Colombia began COVID-19 vaccinations for health-care workers began on February 17, 2021. Eligibility was determined at the national level, and prioritization was based on age, medical vulnerability, and occupation. Colombia's national plan for vaccination outlined 6 groups in order of prioritization: (1) health workers, COVID-affected domestic aid workers, and adults over 80; (2) Domestic care workers, adults between 60 and 70; (3) Adults between 50 and 59, educators, police and military, and individuals 16+ with co-morbid medical conditions; (4) Adults 40-49, incarcerated peoples, caregivers, at-risk populations due to sanitary conditions, non-medical first responders; and (5) People 16+ years of age not prioritized in groups 1-4. As of July 17, 2021, all Colombians over 16 years of age were eligible for at least a first dose of a COVID-19 vaccine.

The official position of the Colombian Health Ministry emphasized that individuals could not elect which vaccine they wanted to receive, but rather needed to vaccinate as soon as eligible and receive the dose which was available to them.[7] The digital tool used to display vaccination sites in Colombia does not disclose the type of doses available at different locations.[8]

A.1.5 México

México began COVID-19 vaccinations for health-care workers on December 24, 2020. México's five-cohort plan for mass vaccinations began on February 15, 2021, when adults over 60 became eligible. México's

[6] See World Bank (2021); Ministerio de Salud - Libro COVID (2022).
[7] See Vanguardia (2021).
[8] See Colombian Health Ministry (2021).

guidelines for vaccine eligibility were based on age, occupation, and health conditions, dividing the population into five cohorts: (1) health professionals, (2) adults over 60, (3) adults between 50-59 and pregnant women over 18, (4) adults between 40-49, and (5) adults over 18. During our survey period, all over over 40 were scheduled to be or become eligible.

While international evaluations found some evidence of vaccine targeting – particularly to poor, rural communities, as well as teachers,[9] the national vaccine observatory at the Autonomous National University of Mexico (UNAM) emphasized that during the mass vaccination program for first and second doses individuals were unable to select which vaccine they would like to receive, and rather received doses based on availability.[10]

A.1.6 Perú

Perú began COVID-19 vaccinations for COVID-19 on February 9, 2021. Perú's eligibility guidelines outlined eight age-based groups, with eligibility based on age decade (i.e., 80+, 70-79, 60-69, 50-59, 40-49, 30-39, 20-29, 12+). After 80+ year olds became eligible in February 2021, each cohort sequentially became eligible for two months, in which the next cohort additionally became eligible in the second month. Adults 60-69 were an exception to this, receiving three months of eligibility with both adults 50-59 and adults 40-49 becoming eligible in the third month (July 2021).

Cue-jumping scandals in Peru highlighted how political insiders gained preferential access to vaccination on several occasions.[11] However, the Peruvian government emphasized that individuals would not be able to select which vaccine they received as part of mass vaccination campaigns, messaging that the best protection from COVID-19 was the one that was available most promptly.[12]

A.2 Adherence to COVID-19 vaccine rollout protocols

We are not aware of systematic and reliable data on adherence to the rollout protocols throughout the region. At the elite level, there have been rare documented cases of people jumping the queue to get their vaccines early. In both Argentina and Perú, scandals relating to politicians getting their vaccines before they were eligible resulted in the resignations of public officials. Moreover, many individuals who could afford a trip to the US have made trips to get their vaccines in states with lax residency requirements, like Florida and Texas, but there is no data that could quantify the prevalence of such vaccine tourism. Nevertheless, for the majority of citizens without economic or political resources, it would have been difficult to game the system and get a vaccine before they were eligible. Indeed, Urdinez and Winters (2021) note that, in each country, "all individuals were given an official document with the name of the vaccine and the date of application."

At a logistical level, all countries experienced some interruptions to their rollouts. In México, challenges to vaccine distribution included militarized resistance from 14 villages, as well as slow efforts to vaccinate migrant populations, and delays due to shortages of the Sputnik V vaccine. Chile, Colombia, and Perú all experienced local vaccine shortages in certain areas, leading to temporary suspension of vaccination campaigns. Salient supply shortages included those in Valparaíso (Chile), Risaralda (Colombia), and Arequipa (Perú);. México experienced widespread delays in dose acquisition at the beginning of their vaccination campaign. Argentina experienced a shortage of Sputnik V second dose vaccines, leading to delays and ultimately the decision of the Argentinian government to provide second doses of Moderna and AstraZeneca for recipients of only one Sputnik V dose. Brazil's vaccination program was plagued by numerous issues; in ad-

[9] See UCSF (2021).

[10] See Observatorio de Vacunación (2021).

[11] See Reuters (2021).

[12] See, for example, Presidencia del Consejo de Ministros (2021).

dition to shortages of vaccines, broader delays in the schedule as well as allegations of corruption challenged Brazil's vaccine rollout.

A.3 Additional information about the panel survey

Our study leverages data from an original online panel survey conducted during the COVID-19 pandemic, where first wave data was collected in January 2021 and second wave data was collected around four months later in May 2021. The baseline survey sought to address two main research questions: to examine how information about vaccines affects vaccine hesitancy; and to understand what features of a vaccine rollout would encourage vaccine uptake. Both research questions are covered in separate articles. The endline survey followed up with individuals who were vaccine-eligible by May 2021, and addressed the research question that is the focus of this article: how do the vaccines that Latin American citizens receive affect affect trust in the governments of the countries where the vaccines were developed? The study was approved by the institutional review board of the research team and complied with relevant ethical regulations for work with human participants. Written informed consent was obtained.

A.3.1 Description of recruitment and different analysis samples

Respondents in each of our six countries—Argentina, Brazil, Chile, Colombia, México, and Perú—were recruited for the baseline survey in January 2021 via Netquest's online panels between January 11 and January 29, 2021. Netquest maintains large opt-in panels of survey respondents in most Latin American countries, including at least 125,000 panelists in each of the countries in our study. Netquest's panelists are regularly invited to take surveys, although this is not their primary vocation. Dynamic enrollment protocols updated invitations to ensure that the sample frame was nationally representative in terms of sex, age category, socioeconomic status, and region. Upon clicking a link to participate, respondents reached a Qualtrics landing page, where information about the academic study was provided—including the prospect of being paid around $2 (USD)—and consent to participate in the study was obtained. Shortly after starting the survey, the 38% of participants that were willing to take a vaccine within two months of it becoming available them were screened out (to facilitate the testing of vaccine encouragements for another part of the broader research project). We also screened out 9 respondents below 18 years of age and 11 respondents who failed our attention check (by failing to correctly identify the capital city of their country). Enrollment continued until a little more than 1,000 vaccine-hesitant respondents had completed the survey from each of the six countries, producing a total of 7,080 complete surveys.

The endline survey recontacted only the baseline survey participants that had become eligible for a first dose of a COVID-19 vaccine in their country by the date of the followup survey in May 2021. We recontacted respondents based on their baseline responses to questions about their age and comorbities. Our endline respondents are thus older and more likely to possess pre-existing comorbities. The fast speed of Chile's vaccination program meant that a higher fraction of Chilean respondents were approached for the endline survey; in contrast, the slow pace of Colombia and Perú's vaccination program meant that Colombians and Peruvians are underrepresented in our endline sample relative to the baseline sample. Participants received around $1 (USD) for completing the shorter endline survey. Ultimately, 1,649 of 3,039 vaccine-eligible baseline participants completed the endline survey.

As the summary statistics in Table A1 verify, the marginal distribution of respondents who completed the baseline survey (i.e., reached our screening juncture) largely approximated the Census distribution for these variables. Unsurprisingly for an online survey, respondents are less representative in terms of education, which Netquest did not seek to balance with population averages. Due to the requirement that respondents be vaccine-eligible, the third column for each country shows that the endline sample is notably older and more likely to be of high socioeconomic status than the national average. Within the endline survey, Table

Table A1: Survey sample summary statistics

	Argentina			Brazil			Chile		
	Census	**Baseline**	**Endline**	**Census**	**Baseline**	**Endline**	**Census**	**Baseline**	**Endline**
Age	47.33	42.59 (17.09)	57.64 (15.43)	41.34	40.48 (15.53)	55.33 (15.37)	44.18	42.67 (16.29)	49.04 (15.12)
Male	0.53	0.46 (0.50)	0.52 (0.50)	0.49	0.50 (0.50)	0.51 (0.50)	0.48	0.47 (0.49)	0.46 (0.50)
Risk Factors		0.29 (0.45)	0.65 (0.47)		0.29 (0.45)	0.73 (0.45)		0.37 (0.48)	0.44 (0.50)
Catholic		0.59 (0.49)	0.66 (0.47)		0.40 (0.49)	0.45 (0.50)		0.45 (0.50)	0.47 (0.50)
Education:									
None	0.13	0.01 (0.08)	0.01 (0.08)	0.11	0.08 (0.27)	0.06 (0.24)	0	0.01 (0.11)	0.01 (0.11)
Primary	0.43	0.14 (0.34)	0.16 (0.37)	0.49	0.12 (0.33)	0.11 (0.31)	0.23	0.07 (0.26)	0.07 (0.25)
Secondary	0.32	0.51 (0.50)	0.42 (0.49)	0.27	0.54 (0.50)	0.54 (0.50)	0.46	0.48 (0.50)	0.43 (0.50)
Higher	0.07	0.20 (0.40)	0.26 (0.44)	0.13	0.16 (0.38)	0.18 (0.39)	0.22	0.25 (0.43)	0.26 (0.44)
Other Higher	0.06	0.15 (0.36)	0.15 (0.35)		0.10 (0.30)	0.11 (0.31)	0.1	0.19 (0.39)	0.22 (0.41)
SES:									
Low	0.13	0.15 (0.36)	0.17 (0.37)	0.26	0.32 (0.47)	0.19 (0.40)	0.42	0.36 (0.48)	0.32 (0.47)
Middle	0.80	0.80 (0.40)	0.73 (0.45)	0.66	0.62 (0.47)	0.69 (0.46)	0.48	0.57 (0.49)	0.59 (0.49)
High	0.07	0.05 (0.23)	0.11 (0.31)	0.08	0.06 (0.24)	0.12 (0.32)	0.1	0.07 (0.26)	0.09 (0.28)

	Colombia			Mexico			Perú		
	Census	**Baseline**	**Endline**	**Census**	**Baseline**	**Endline**	**Census**	**Baseline**	**Endline**
Age	42.54	38.22 (15.11)	66.57 (4.44)	42.44	38.09 (14.17)	54.06 (9.28)	41.99	38.22 (14.71)	52.64 (15.50)
Male	0.48	0.44 (0.50)	0.62 (0.49)	0.48	0.46 (0.50)	0.50 (0.50)	0.48	0.42 (0.49)	0.49 (0.50)
Risk Factors		0.24 (0.43)	0.45 (0.50)		0.31 (0.46)	0.42 (0.49)		0.28 (0.45)	0.70 (0.46)
Catholic		0.60 (0.49)	0.67 (0.47)		0.63 (0.48)	0.71 (0.45)		0.66 (0.47)	0.72 (0.45)
Education:									
None	0.05	0.01 (0.11)	0.06 (0.24)	0.14	0.00 (0.06)	0.00 (0.06)	0.05	0.00 (0.07)	0.01 (0.08)
Primary	0.38	0.03 (0.15)	0.06 (0.24)	0.16	0.04 (0.19)	0.05 (0.21)	0.20	0.02 (0.12)	0.00 (0.00)
Secondary	0.29	0.33 (0.47)	0.27 (0.45)	0.54	0.44 (0.50)	0.38 (0.49)	0.51	0.39 (0.48)	0.25 (0.44)
Higher	0.16	0.49 (0.50)	0.48 (0.50)	0.14	0.28 (0.45)	0.40 (0.49)	0.14	0.30 (0.46)	0.37 (0.48)
Other Higher	0.11	0.14 (0.34)	0.14 (0.35)	0.01	0.24 (0.42)	0.16 (0.37)	0.10	0.29 (0.45)	0.37 (0.49)
SES:									
Low	0.43	0.47 (0.50)	0.53 (0.50)	0.33	0.36 (0.48)	0.19 (0.39)	0.42	0.54 (0.50)	0.26 (0.44)
Middle	0.45	0.43 (0.49)	0.38 (0.48)	0.46	0.45 (0.50)	0.57 (0.50)	0.50	0.41 (0.49)	0.65 (0.48)
High	0.12	0.10 (0.30)	0.11 (0.31)	0.21	0.19 (0.39)	0.24 (0.43)	0.08	0.05 (0.21)	0.09 (0.29)

Notes: The Census data (where a variable corresponds to our survey questions) is drawn from the most recent available Census data, with the exception of the data for socioeconomic level, which was provided by Netquest. Each value is a mean; standard deviations are in parentheses.

A2 compares the vaccinated and experimental samples with the 2021 LAPOP and latest Census distributions. As noted in the main text, the mean members of our two analysis samples is relatively similar, at least in terms of observables, to the LAPOP and Census aggregates.

A.3.2 Distribution of trust in vaccine-developing countries

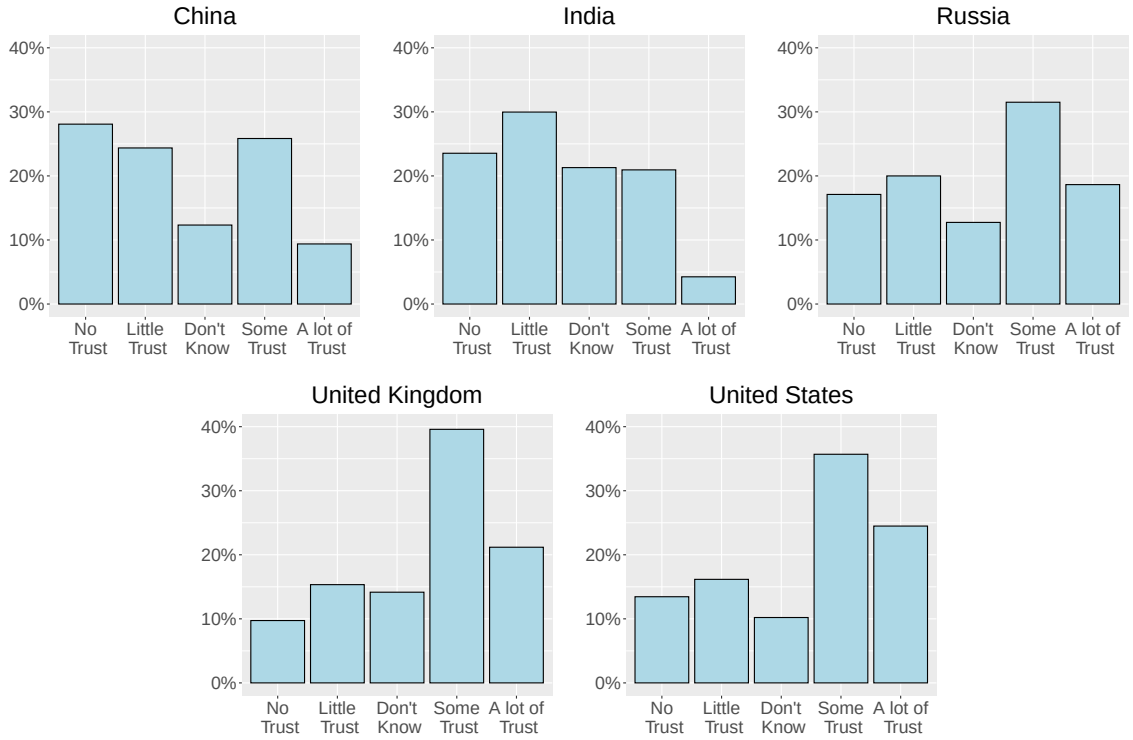
Figure A1 reports the distribution of trust by vaccine-developer country. While respondents had moderate levels of trust in each country at baseline, trust in the UK and US was notably higher than trust in Russia and China.

Table A2: Sample means, in comparison with 2021 LAPOP survey and recent census data

	Vaccinated sample	**Experimental sample**	**LAPOP 2021**	**Latest census**
Age	57.8	53.9	40.9	43.3
Male	52.3%	49.0%	49.5%	49.2%
Completed no formal education	1.3%	1.9%	1.2%	8.0%
Completed primary education	6.8%	7.9%	12.2%	31.5%
Completed secondary education	37.2%	41.4%	37.8%	39.8%
Completed tertiary education	54.7%	48.8%	48.9%	20.7%
Low socioeconomic status	23.0%	18.9%	20.8%	29.4%
Medium socioeconomic status	60.5%	60.0%	53.7%	61.9%
High socioeconomic status	16.5%	21.1%	25.5%	8.7%
Worse personal economic situation than before COVID-19	54.7%	57.9%	54.9%	
Believe COVID-19 is somewhat or very serious	76.3%	73.0%	73.0%	
Some or a lot of trust in mayor or local government	48.5%	42.9%	38.4%	
Some or a lot of trust in China	41.3%	35.4%	37.7%	
Some or a lot of trust in US	68.1%	60.3%	53.2%	

Notes: Census data is based on Netquest's sampling strategy. Our survey asked about the seriousness of COVID-19 pandemic, whereas the LAPOP survey asked about how worried people are about the COVID-19 pandemic.

Figure A1: Distribution of trust in vaccine-developing countries



Note: Each figure pools initial endline responses across respondents from all countries.

A.3.3 Measurement of key variables

We identify the country where a respondent believed their vaccine was developed using the following question (with available answers in brackets):[13]

> Do you know what country developed the vaccine that you received? [China, USA, India, UK, Russia, Don't know, Don't remember]

We then coded our treatment variable as an indicator for the country that the respondent believed their vaccine was developed in. We drop respondents who did not know or remember in our main analyses.

Our primary outcome variable—trust in a foreign government—is based on asking the following question of the Chinese, Indian, Russian, UK, and US governments (in a random order):

> How much trust do you have in the current governments of the following countries? [No trust at all, Little trust, Some trust, A lot of trust, Don't know]

This question was asked once within the baseline survey and twice within the endline survey. In the endline survey, the first question (the outcome for the observational analysis) was near the beginning of the survey and appeared again late in the survey after the information treatment had been disseminated. We coded our main outcome variable in two ways: (i) as a four-point scale ranging from "no trust at all" (0) to "a lot of trust" (4), with "don't know" responses coded at the median of the scale (2.5); and (ii) as an indicator for respondents who responded "some trust" or "a lot of trust". As Tables A7 and A8 show, the results for both outcomes are robust to dropping respondents who answered "don't know."

To illuminate respondents' perceptions of country motivations for distributing vaccines in the respondent's country, we asked the following question separately of the three developer countries from which most vaccines had been distributed after the dissemination of the information treatment:

> Indicate the statements you agree with regarding the following sentence:
>
> <Developer country> is providing vaccines to <respondent country> in order to:
>
> - Quickly stop the spread of COVID-19 around the world
> - Help the citizens of <respondent country>
> - Increase support for <developer country> among in the population of <respondent country>
> - Increase the dependence of <respondent country> on <Developer country>
> - Obtain economic profits

We used this question to code five outcome variables, each indicating whether or not a respondent selected a given statement.

A.4 Estimating the effect of personally receiving a particular vaccine

A.4.1 Identification strategy and validation

As noted in the main text, our identification strategy rests on the assumption that the country where an individual believed that their vaccine was developed is independent of potential outcomes, conditional on the individual's eligibility category within their country. Based on the eligibility rules and guidelines described in Section A.1, we constructed bins of individuals who became vaccine-eligible around the same time. To

Table A3: Vaccine eligibility blocks (by the time of the survey)

	Eligibility Blocks					
	Block 1	*Block 2*	*Block 3*	*Block 4*	*Block 5*	*Block 6*
Argentina	80+	70-79	60-69 with co-morbidities	55-59	NA	NA
Brazil	80+	70-79	60-69 with co-morbidities	40 plus	56 plus	
Chile	71+	65-70	60-65 46+ with co-morbidities	50-59 16+ with co-morbidities	40-49	17+
Colombia	80+	60-79	50-59 16+ with co-morbidities	40-49	NA	NA
México	60+	50-59	40-49	With co-morbidities	NA	NA
Perú	80+	70-79	60-69	50-59	NA	NA

create these bins, we followed national administrative guidelines and plans articulated in each country for when adults would become eligible. These groups, defined by age and risk factors, are shown in Table A3.

Given that the type of vaccine received was not actually randomized, it remains possible that individuals with higher or lower trust in certain foreign governments might have been more likely to receive or recall receiving particular types of vaccine. This could arise if individuals choose the location or timing of their vaccine to obtain a particular type of vaccine, if localities containing certain types of respondent were allocated particular types of vaccine, or if recipients were more familiar with where certain types of vaccines were developed. To assess the validity of the design, we use our baseline survey responses—which were collected before any respondent had been vaccinated—to examine whether the respondents who reported receiving vaccines developed in different countries are systematically different across a wide range of economic, health, political, etc. characteristics. Our covariate balance tests entail estimating the following regression for each baseline covariate:

$$X_{ic} = \alpha_{gc} + \tau_1 \textit{China developed vaccine}_{ic} + \tau_2 \textit{Russia developed vaccine}_{ic} + \tau_3 \textit{UK developed vaccine}_{ic} + \varepsilon_{ic},$$

where respondents who reported receiving a vaccine developed in the US are the omitted baseline category, and α_{gc} are country-eligibility group fixed effects. To test for differences across respondents in terms of characteristic X_{ic}, we calculate the p value associated with the F test of the joint restriction $\tau_1 = \tau_2 = \tau_3 = 0$. Broadly consistent with chance, the results in Table A4 show that we only reject this null hypothesis of no differences in mean characteristics across vaccine-developer groups at the 10% significance level for 10 of 86 covariates. When we further non-parametrically adjust for prior trust, by including $\sum_r \beta_{dr} \mathbb{1}[\textit{Prior trust}_{dic} = r]$ in the regression equation, the final column shows that we similarly observe only 11 statistically significant differences. This suggests that the country where an individual's vaccine was developed was assigned in a plausibly exogenous manner.

A.4.2 Effects by respondent country

Table A5 reports the estimates pooling across vaccine-developer countries by the country of the respondent country separately. While the estimates are of course noisier in these subsamples (especially in the countries where few individuals had been vaccinated at the time of our endline survey), the estimated effect in each

[13]The full survey instrument in Spanish (Argentine version) and Portuguese can be found [BLINDED].

Table A4: Covariate balance across individuals who reported receiving vaccines developed in different countries

Predetermined covariate	Mean	Std. dev.	Equality test (p value)	Equality test conditional on prior trust (p value)
Education	3.81	1.04	0.570	0.749
Education - At Least Primary	0.01	0.11	0.239	0.215
Education - At Least Secondary	0.08	0.28	0.039**	0.136
Education - At Least Other Higher	0.45	0.50	0.728	0.878
Education - At Least University	0.64	0.48	0.962	0.985
Female	0.52	0.50	0.140	0.287
Running Water in Home	0.96	0.19	0.875	0.878
Sewage in Home	0.82	0.39	0.878	0.707
Electricity in Home	0.95	0.21	0.731	0.664
No Running Water, Sewage, or Electricity in Home	0.00	0.04	0.870	0.912
Baseline COVID News Consumption - Aggregate	4.76	1.39	0.049**	0.169
Baseline COVID News Consumption - TV	5.95	1.74	0.450	0.594
Baseline COVID News Consumption - Radio	4.07	2.54	0.832	0.890
Baseline COVID News Consumption - Print	3.57	2.50	0.061*	0.118
Baseline COVID News Consumption - Word of Mouth	5.43	1.86	0.164	0.287
Baseline COVID News Consumption - WhatsApp	4.70	2.32	0.205	0.152
Baseline COVID News Consumption - Social Media	4.76	2.37	0.162	0.230
Baseline COVID News Consumption - News Websites	4.96	2.24	0.018**	0.030**
COVID Severity in Country	3.65	0.69	0.255	0.362
Percentage of vaccinated people needed to achieve herd community	83.40	19.69	0.113	0.091*
General Vaccine Hesitancy - Protect from Disease	4.09	0.96	0.120	0.047**
General Vaccine Hesitancy - Good for Community	4.18	0.90	0.520	0.382
General Vaccine Hesitancy - Trust in Government	3.14	1.29	0.345	0.378
General Vaccine Hesitancy - Follow Doctor Instructions	3.95	0.98	0.521	0.487
General Vaccine Hesitancy - Trust in International Medical Experts	3.99	0.94	0.170	0.101
General Vaccine Hesitancy - Refused Vaccine	0.13	0.33	0.997	0.994
COVID Hesitancy Reasons - Side Effects	0.54	0.50	0.989	0.973
COVID Hesitancy Reasons - Vaccine Gives COVID	0.09	0.29	0.361	0.361
COVID Hesitancy Reasons - Produced Too Quickly	0.49	0.50	0.553	0.701
COVID Hesitancy Reasons - Not Effective	0.13	0.34	0.164	0.209
COVID Hesitancy Reasons - Not At Risk of Getting COVID	0.02	0.13	0.842	0.863
COVID Hesitancy Reasons - Against Vaccines Generally	0.01	0.12	0.492	0.454
COVID Hesitancy Reasons - Prefer 'Natural' Immunity	0.04	0.20	0.131	0.183
COVID Hesitancy Reasons - Already Had COVID	0.05	0.21	0.536	0.432
COVID Hesitancy Reasons - Don't Trust Government	0.31	0.46	0.251	0.258
COVID Hesitancy Reasons - Financial Concerns	0.09	0.29	0.361	0.201
COVID Hesitancy Reasons - Other	0.10	0.29	0.102	0.160
Comorbidities - None	0.50	0.50	0.542	0.521
Comorbidities - Diabetes	0.16	0.36	0.363	0.364
Comorbidities - Cardiovascular Diseases	0.15	0.36	0.470	0.516
Comorbidities - Obesity	0.20	0.40	0.026**	0.026**
Comorbidities - Autoimmune Diseases	0.06	0.24	0.876	0.746
Comorbidities - Chronic Obstructive Pulmonary Disease	0.06	0.24	0.061*	0.059*
Comorbidities - Prefer Not To Share	0.03	0.17	0.009***	0.024**
Had COVID	0.09	0.29	0.151	0.097*
Know Someone Seriously Ill or Passed Away COVID	0.70	0.46	0.341	0.378
COVID Economic Situation	2.32	0.82	0.710	0.646
Government Vaccine Priority	3.36	1.14	0.263	0.294
Left/Right Political Scale	5.34	2.04	0.133	0.433
Satisfied with President COVID Management	2.19	1.37	0.761	0.908
Satisfied with Mayor COVID Management	2.68	1.28	0.539	0.764
Satisfied with Health Ministry COVID Management	2.44	1.30	0.271	0.447
Would Vote for Current President	0.22	0.42	0.461	0.549
Would Vote for Current Mayor	0.27	0.45	0.622	0.702
Trust in Current President	1.97	1.11	0.547	0.756
Trust in Current Mayor	2.39	1.04	0.846	0.889
Trust in National Health Ministry	2.29	1.10	0.170	0.309
Trust in National Medical Association	3.02	0.89	0.240	0.376
Trust in Left-Wing Newspaper	2.24	0.95	0.520	0.411
Trust in Right-Wing Newspaper	2.21	1.02	0.864	0.839
Trust in Religious Leader	2.03	0.89	0.387	0.210
Trust in Local Healthcare	3.27	0.77	0.133	0.206
Trust in Armed Forces	2.81	1.02	0.603	0.567
Trust in Civil Society Organizations	2.70	0.78	0.784	0.773
Trust in Government of China (baseline)	1.89	0.84	0.160	
Trust in Government of US Under Trump (baseline)	1.76	0.93	0.062*	0.04**
Trust in Government of US Under Biden (baseline)	2.59	0.91	0.621	
Trust in Government of UK (baseline)	2.59	0.88	0.894	
Trust in Government of Russia (baseline)	2.22	0.90	0.859	
Meeting Indoor With Non-Family Contributes to COVID	3.56	0.82	0.479	0.573
Risk Aversion	0.96	0.62	0.385	0.268
Discount Rate	3.28	0.79	0.635	0.748
Donation Amount	0.47	0.32	0.864	0.885
Important to Receive Respect and Recognition	2.73	0.99	0.079*	0.067*
Social Influence	2.31	0.84	0.478	0.371
Vaccine Information Treatment	0.20	0.40	0.452	0.305
Vaccine Information Treatment with Biden Endorsement	0.15	0.35	0.470	0.432
Vaccine Information Treatment with Expert Herd Immunity Prediction (60%)	0.07	0.25	0.752	0.675
Vaccine Information Treatment with Expert Herd Immunity Prediction (70%)	0.07	0.25	0.742	0.589
Vaccine Information Treatment with Expert Herd Immunity Prediction (70%)	0.07	0.26	0.115	0.127
Vaccine Information Treatment with Expert Herd Immunity Prediction (60%) and Current Willingness	0.10	0.30	0.206	0.178
Vaccine Information Treatment with Expert Herd Immunity Prediction (70%) and Current Willingness	0.08	0.27	0.454	0.589
Vaccine Information Treatment with Expert Herd Immunity Prediction (80%) and Current Willingness	0.08	0.27	0.018**	0.019**
Motivation Treatment - Altruism	0.26	0.44	0.151	0.145
Motivation Treatment - Economic Recovery	0.25	0.43	0.404	0.431
Motivation Treatment - Social Approval	0.25	0.43	0.122	0.091*

Note: Each statistic is the p value associated with an F test of the null hypothesis that the mean value across respondents who reported receiving vaccines developed in different countries is the same, based on an OLS regression including eligibility group $\times$ respondent country fixed effects and (for the final column) country-specific indicators for each level of pre-treatment baseline survey trust and robust standard errors. Eligibility groups are defined in Table A3.

Table A5: The effect of receiving a particular vaccine on an individual's trust in the government of the country where the vaccine was developed, by respondent country

	Outcome: trust in foreign government (all governments)					
	Argentinean respondents (1)	Brazilian respondents (2)	Chilean respondents (3)	Colombian respondents (4)	Mexican respondents (5)	Peruvian respondents (6)
Panel A: Outcome: trust in foreign government scale						
Country developed vaccine	0.137	0.375***	0.159*	0.042	0.161	0.215
	(0.109)	(0.144)	(0.085)	(0.140)	(0.108)	(0.262)
R^2	0.32	0.32	0.22	0.31	0.22	0.29
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}
Control outcome mean	2.80	2.59	2.70	2.92	2.80	2.66
Control outcome std. dev.	0.92	1.02	0.90	0.79	0.86	1.06
Panel B: Outcome: some or a lot of trust in foreign government indicator						
Country developed vaccine	0.088	0.128**	0.074	-0.008	0.047	0.058
	(0.060)	(0.064)	(0.047)	(0.091)	(0.059)	(0.112)
R^2	0.26	0.27	0.18	0.22	0.15	0.28
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Control outcome mean	0.60	0.54	0.59	0.60	0.62	0.57
Control outcome std. dev.	0.49	0.50	0.49	0.49	0.49	0.50
Country developed vaccine mean	0.25	0.25	0.25	0.25	0.25	0.25
Observations	592	368	1,228	144	356	148

Notes: Each specification includes eligibility group × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment baseline survey trust, and is estimated using OLS. Eligibility groups are defined in Table A3. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

country is positive. The effect is smallest in Colombia, but relatively large and similar in magnitude in each other country.

A.4.3 Reweighting to match the population

Our main estimates do not apply population weights for each respondent to maximize the efficiency of our estimation of average treatment effects. However, as noted in the main paper, the sample is not nationally representative of adults for several reasons. To examine how the results extend to the general population, we further weight our estimates. In particular, we apply rake weights to reweight observations according to the product of in-survey marginal distribution, relative to the national marginal distribution, across age category, education level, region, gender, and (using data provided by Netquest) socioeconomic class. The results are reported in Table A6, and are discussed in the main paper. Unreported analyses show that we obtain relatively similar results if we reweight according to the joint distribution, although the estimates are far noisier (due to limited numbers of observations in some cells).[14]

A.4.4 Robustness checks

We next demonstrate that the positive effect of believing a vaccine was developed in a particular country on trust in that country's government, relative to trust in the governments of other vaccine-developing countries,

[14]The census data does not consistently include socioeconomic class, so this dimension is omitted from the joint weights.

Table A6: The effect of receiving a particular vaccine on an individual's trust in the government of the country where the vaccine was developed—with population weights

	Pooling all governments (1)	Chinese government (2)	Russian government (3)	UK government (4)	US government (5)
Panel A: Outcome: trust in foreign government scale—rake weights					
Country developed vaccine	0.166***	0.170	-0.065	0.364***	0.188
	(0.052)	(0.121)	(0.172)	(0.127)	(0.126)
R^2	0.28	0.27	0.27	0.24	0.22
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}
Control outcome mean	2.71	2.35	2.66	2.87	2.80
Control outcome std. dev.	0.92	0.96	0.92	0.85	0.90
Country developed vaccine mean	0.25	0.53	0.20	0.11	0.17
Observations	2,792	698	698	698	698
Panel B: Outcome: some or a lot of trust in foreign government indicator—rake weights					
Country developed vaccine	0.072***	0.077	-0.070	0.210***	0.073
	(0.026)	(0.064)	(0.100)	(0.062)	(0.077)
R^2	0.24	0.26	0.22	0.19	0.16
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Control outcome mean	0.57	0.37	0.55	0.67	0.62
Control outcome std. dev.	0.49	0.48	0.50	0.47	0.49
Country developed vaccine mean	0.25	0.53	0.20	0.11	0.17
Observations	2,792	698	698	698	698

Notes: The specification in each column includes eligibility group × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects and country-specific indicators for each level of pre-treatment baseline survey trust, which are omitted to save space, and is estimated using WLS. Eligibility groups are defined in Table A3. The weights in panels A and B reflect the country-specific marginal distribution in terms of age category, education level, region, gender, and socioeconomic class. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

is robust to various alternative specifications. The pooled and country-by-country results are reported in Tables A7 and A8.

First, we address the potential concern that differences in the vaccines that survey respondents received are correlated with local differences in where different types of vaccines were delivered. Accordingly, we leverage variation in the type of vaccine received by individuals in a given eligibility group *within the same locality* by including country-eligibility group $\times$ vaccine-developer country $\times$ locality fixed effects. These fixed effects absorb all differences in trust in a particular foreign government across individuals in different eligibility groups within a particular location. We operationalize locality in terms of both region—state, province, or department—and municipality. The results in panels A and B of Tables A7 and A8 show that our findings are robust to the inclusion of either set of interactive fixed effects. Although estimate precision declines,[15] in both cases to detect statistically significant and numerically similar point estimates.

Second, we address the possibility that certain types of individuals within particular eligibility (and location) groups may have sought out or been more likely to recall receiving particular vaccines by probing whether differences in the types of individuals who reported receiving vaccines developed in different countries are driving the results. The estimates in panel C of Tables A7 and A8 show that our findings are robust to adjusting for the 10 covariates that registered statistically significant imbalances (see Table A4). Panel D shows that the results are also robust to including all 86 individual-level covariates over which we examined balance.[16]

Third, we consider an alternative approach comparing respondents who reported receiving different vaccines with respondents who reported being unvaccinated. We conduct a difference-in-differences analysis to abstract from time-invariant differences across respondents. The results in panel E of Tables A7 and A8 indicate that, relative to unvaccinated respondents and individuals who reported receiving other vaccines, individuals became significantly more trusting of the government of the country where their particular vaccine was developed. The similar point estimates suggest that our main estimates are not driven by decreases in trust in the countries that an individual did not receive a vaccine from.

Fourth, we address the possibility that the results could be driven by respondent misperceptions of the country that developed the vaccine they received. For instance, individuals with a positive view of the US might be more likely to believe that a vaccine was developed in the US. This is unlikely because—as Table A4 shows—baseline trust in a foreign government does not significantly predict the likelihood of recalling receiving a vaccine from that country. Nevertheless, to increase confidence that biased recall is not driving our results, we also define treatment by the country of the manufacturer of the vaccine that a respondent reported having received; the country is the same as our preferred definition of treatment 91% of the time. Panel F of Tables A7 and A8 reports similar results using this alternative operationalization of treatment. Although it is not clear if respondents are more likely to accurately recall the brand or the country that developed their vaccine, these results suggest that the intent to treat effect from the perspective of foreign government's vaccine distribution produces similar results. Panel G further shows that our main findings are robust to restricting our sample to the respondents for whom perceptions of the country where their vaccine was developed match the country of the manufacturer.

Fifth, we demonstrate that our findings do not depend on the coding of "don't know" responses to the trust question. For our ordinal measure of trust, the main analyses coded these responses at the median of the outcome range. Panel H of Tables A7 and A8 shows that dropping these responses does not meaningfully alter our estimates; in this specification, the increase in trust in the US government is notably larger and statistically significant. Combined with our results for the binary trust outcome—which simply categorizes "don't know" responses as not trusting—we are confident that the coding of these responses does not account

[15]The interactive fixed effects using municipality perfectly explain a substantial number of observations because there is no variation in treatment within sparsely populated fixed effect cells.

[16]The sample size declines due to non-responses for some baseline covariates.

Table A7: Robustness checks for the effect of receiving a particular vaccine on an individual's trust in the government of the country where the vaccine was developed

	Outcome: trust in foreign government scale				
	Pooling all governments	Chinese government	Russian government	UK government	US government
	(1)	(2)	(3)	(4)	(5)
Panel A: Developer country × country-eligibility group × region fixed effects					
Country developed vaccine	0.175***	0.295**	-0.035	0.268**	0.058
	(0.053)	(0.117)	(0.179)	(0.133)	(0.114)
Observations	2,836	709	709	709	709
Panel B: Developer country × country-eligibility group × municipality fixed effects					
Country developed vaccine	0.225**	0.283	0.284	0.134	0.185
	(0.108)	(0.221)	(0.361)	(0.251)	(0.248)
Observations	2,836	709	709	709	709
Panel C: Adjusting for imbalanced predetermined covariates					
Country developed vaccine	0.164***	0.251***	-0.027	0.229**	0.150
	(0.040)	(0.088)	(0.127)	(0.101)	(0.092)
Observations	2,788	697	697	697	697
Panel D: Adjusting for 86 predetermined covariates					
Country developed vaccine	0.181***	0.219**	0.066	0.221**	0.093
	(0.042)	(0.092)	(0.135)	(0.107)	(0.100)
Observations	2,548	637	637	637	637
Panel E: Difference-in-differences estimates including unvaccinated respondents					
Country developed vaccine	0.216***	0.264***	0.088	0.162	0.245**
	(0.042)	(0.062)	(0.107)	(0.116)	(0.101)
Observations	6,628	1,657	1,657	1,657	1,657
Panel F: Defining treatment by country of reported vaccine manufacturer					
Country of vaccine manufacturer	0.196***	0.291***	0.037	0.196*	0.135
	(0.038)	(0.083)	(0.130)	(0.105)	(0.090)
Observations	2,836	709	709	709	709
Panel G: Dropping respondents where perception and manufacturer country disagree					
Country developed vaccine	0.189***	0.242***	0.082	0.227*	0.148
	(0.043)	(0.093)	(0.132)	(0.127)	(0.102)
Observations	2,572	643	643	643	643
Panel H: Dropping respondents who answered "don't know"					
Country developed vaccine	0.191***	0.245***	-0.001	0.228**	0.169*
	(0.042)	(0.091)	(0.128)	(0.103)	(0.097)
Observations	2,548	636	709	633	647
Panel I: Ordered logit estimation					
Country developed vaccine	0.405***	0.524**	0.069	0.527*	0.351
	(0.093)	(0.187)	(0.292)	(0.256)	(0.206)
Observations	2,836	709	709	709	709

Notes: The specifications in panels A and B include the fixed effects noted in the panel title. The specifications in panel C and D include eligibility group × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects, baseline survey trust, and baseline covariates. The specifications in panel E include unvaccinated respondents and implement a difference-in-differences estimates by first-differencing equation (1) with respect to the baseline survey. The specifications in panels F-H include eligibility group × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects and country-specific indicators for each level of pre-treatment baseline survey trust. The specifications in panel I estimate equation (1) using ordered logit. All covariates other than the treatment variable are omitted to save space, and all specifications except panel I are estimated using OLS. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Robustness checks for the effect receiving a particular vaccine on an individual's trust in the government of the country where the vaccine was developed—binary trust outcome

	Outcome: some or a lot of trust in foreign government indicator				
	Pooling all governments	Chinese government	Russian government	UK government	US government
	(1)	(2)	(3)	(4)	(5)
Panel A: Developer country × country-eligibility group × region fixed effects					
Country developed vaccine	0.082***	0.130**	-0.058	0.155**	0.045
	(0.029)	(0.058)	(0.094)	(0.067)	(0.068)
Observations	2,836	709	709	709	709
Panel B: Developer country × country-eligibility group × municipality fixed effects					
Country developed vaccine	0.108**	0.102	0.083	0.038	0.200
	(0.051)	(0.105)	(0.173)	(0.126)	(0.140)
Observations	2,836	709	709	709	709
Panel C: Adjusting for imbalanced predetermined predetermined covariates					
Country developed vaccine	0.067***	0.099**	-0.055	0.120**	0.071
	(0.022)	(0.046)	(0.070)	(0.056)	(0.050)
Observations	2,788	697	697	697	697
Panel D: Adjusting for 86 predetermined covariates					
Country developed vaccine	0.076***	0.096**	-0.007	0.100	0.028
	(0.023)	(0.048)	(0.077)	(0.064)	(0.055)
Observations	2,548	637	637	637	637
Panel E: Difference-in-differences estimates including unvaccinated respondents					
Country developed vaccine	0.090***	0.150***	-0.022	0.051	0.066
	(0.024)	(0.033)	(0.060)	(0.071)	(0.056)
Observations	6,628	1,657	1,657	1,657	1,657
Panel F: Defining treatment by country of reported vaccine manufacturer					
Country developed vaccine	0.091***	0.132***	-0.060	0.147***	0.063
	(0.022)	(0.044)	(0.074)	(0.056)	(0.049)
Observations	2,836	709	709	709	709
Panel G: Dropping respondents where perception and manufacturer country disagree					
Country developed vaccine	0.077***	0.110**	-0.028	0.122*	0.059
	(0.024)	(0.049)	(0.074)	(0.065)	(0.057)
Observations	2,572	643	643	643	643
Panel H: Dropping respondents who answered "don't know"					
Country developed vaccine	0.082***	0.107**	-0.047	0.110**	0.070
	(0.021)	(0.046)	(0.069)	(0.048)	(0.048)
Observations	2,548	636	709	633	647
Panel I: Logit estimation					
Country developed vaccine	0.363***	0.512**	-0.234	0.684*	0.352
	(0.113)	(0.226)	(0.341)	(0.380)	(0.268)
Observations	2,836	709	709	709	709

Notes: The specifications in panels A and B include the fixed effects noted in the panel title. The specifications in panel C and D include eligibility group × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects, baseline survey trust, and baseline covariates. The specifications in panel E include unvaccinated respondents and implement a difference-in-differences estimates by first-differencing equation (1) with respect to the baseline survey. The specifications in panels F-H include eligibility group × respondent country (× vaccine-developer country, for the pooled specification in column (1)) fixed effects and country-specific indicators for each level of pre-treatment baseline survey trust. The specifications in panel I estimate equation (1) using logit. All covariates other than the treatment variable are omitted to save space, and all specifications except panel I are estimated using OLS. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

for our findings.

Finally, when estimating equation (1) in the main paper using ordered logit or logit instead of OLS, panel I of Tables A7 and A8 reports similarly statistically significant and positive effects on a respondent's level of trust in the government of the country where a respondent's vaccine was developed. The average marginal effects within our sample imply that believing your vaccine was developed a particular country increased the probability of trusting that country's government by 1.9 percentage points and the probability of strongly trusting that country's government by 5.7 percentage points; a response in any other category became significantly less likely. These average marginal effects are computed at the means of other covariates.

A.5 Estimating the effect of information about vaccine distribution

A.5.1 Identification strategy and validation

The treatment effects of the aggregate vaccine information treatment are identified under two assumptions: (i) the stable unit treatment value assumption (SUTVA); and (ii) unconfounded treatment assignment. SUTVA almost certainly holds because interference between respondents between the start and end of the endline survey is implausible in the large countries under study and because versions of treatment were controlled by the research team. Although treatments were randomly assigned, identification could still be confounded by chance imbalances or differential attrition across treatment groups within the survey. However, as Table A9 shows, the predetermined characteristics (baseline survey responses and pre-treatment endline responses) of respondents who answered our main post-treatment trust question are well-balanced across treatment groups: in line with chance, we only reject the null hypothesis of equality of mean for 8 of 101 characteristics at the 10% significance level in our baseline specification in equation (2). The penultimate column reports 7 significant differences when predetermined trust covariates are excluded from the regression equation.

Due to time constraints, the experiment was not pre-registered and the analysis does not follow a pre-analysis plan. However, it should be noted that our statistical analyses follow standard experimental procedures: we estimate OLS regressions, including only randomization block fixed effects and lagged outcomes as covariates; moreover, we code the outcome variable in two natural ways—as a scale and binary. The heterogeneous effects by the information provided in the treatment and how it relates to prior beliefs are widespread in the belief updating literature (e.g. Dunning et al., 2019).

A.5.2 Effects by respondent country

Tables A10 and A11 report the estimates pooling across vaccine-developer countries by the country of the respondent country separately. As the estimates in panels B and C illustrate, notable changes in trust due to treatment content are induced in each country other than Perú. In the other countries, the point estimates for the interaction terms are remarkably homogeneous. Panel A shows that positive updating on average is driven by Chilean respondents.

A.5.3 Robustness checks

Tables A12 and A13 report various robustness checks for the pooled specification. Country-specific results are available upon request. First, column (1) reports our main estimates, adjusting for the few covariates that are imbalanced across treatment conditions. The results are not substantively affected.

Second, when eliciting prior beliefs about the ranking of vaccine-developing countries, the survey instrument allowed respondents to indicate ties by providing the same ranking (between 1 and 5) multiple times. While 72% of respondents provide a unique set of ranks, i.e., a different ranking for each country, others

Table A9: Covariate balance across treated and control individuals

Predetermined covariate	Mean	Std. dev.	Equality test (p value)	Equality test conditional on prior trust (p value)
Received COVID Vaccine	0.63	0.48		
Received Chinese COVID Vaccine	0.23	0.42	0.518	0.712
Received Indian COVID Vaccine	0.02	0.14	0.994	0.914
Received Russian COVID Vaccine	0.09	0.28	0.318	0.695
Received UK COVID Vaccine	0.04	0.20	0.723	0.561
Received US COVID Vaccine	0.07	0.26	0.482	0.651
Endline COVID News Consumption - Aggregate	3.76	1.40	0.847	0.609
Endline COVID News Consumption - TV	4.94	1.79	0.706	0.937
Endline COVID News Consumption - Radio	3.10	2.54	0.101	0.068*
Endline COVID News Consumption - Print	2.48	2.50	0.220	0.160
Endline COVID News Consumption - Word of Mouth	4.49	1.71	0.978	0.761
Endline COVID News Consumption - WhatsApp	3.51	2.31	0.603	0.679
Endline COVID News Consumption - Social Media	3.92	2.28	0.374	0.422
Endline COVID News Consumption - News Websites	3.86	2.30	0.467	0.702
COVID Vaccine Talked About Benefits	0.89	0.32		
COVID Vaccine Talked About Side Effects	0.81	0.39	0.079*	0.038**
COVID Vaccine Encouraged Others	2.07	1.09	0.114	0.379
Education	3.67	1.04	0.473	0.346
Education - At Least Primary	0.02	0.14	0.288	0.354
Education - At Least Secondary	0.10	0.30	0.475	0.539
Education - At Least Other Higher	0.51	0.50	0.262	0.140
Education - At Least University	0.70	0.46	0.799	0.689
Female	0.50	0.50	0.416	0.602
Running Water in Home	0.95	0.23	0.318	0.308
Sewage in Home	0.80	0.40	0.340	0.326
Electricity in Home	0.95	0.21	0.859	0.953
No Running Water, Sewage, or Electricity in Home	0.00	0.06	0.740	0.694
Baseline COVID News Consumption - Aggregate	4.59	1.49	0.122	0.190
Baseline COVID News Consumption - TV	5.75	1.88	0.192	0.310
Baseline COVID News Consumption - Radio	3.95	2.53	0.811	0.895
Baseline COVID News Consumption - Print	3.39	2.45	0.753	0.933
Baseline COVID News Consumption - Word of Mouth	5.32	1.90	0.526	0.625
Baseline COVID News Consumption - WhatsApp	4.42	2.40	0.348	0.409
Baseline COVID News Consumption - Social Media	4.70	2.41	0.102	0.093*
Baseline COVID News Consumption - News Websites	4.81	2.29	0.258	0.325
COVID Severity in Country	3.58	0.79	0.033**	0.063*
Percentage of vaccinated people needed to achieve herd community	79.64	25.18	0.135	0.181
General Vaccine Hesitancy - Protect from Disease	3.89	1.10	0.965	0.697
General Vaccine Hesitancy - Good for Community	4.01	1.03	0.924	0.739
General Vaccine Hesitancy - Trust in Government	3.01	1.30	0.413	0.529
General Vaccine Hesitancy - Follow Doctor Instructions	3.78	1.06	0.674	0.497
General Vaccine Hesitancy - Trust in International Medical Experts	3.77	1.08	0.423	0.682
General Vaccine Hesitancy - Refused Vaccine	0.16	0.37	0.295	0.492
COVID Hesitancy Reasons - Side Effects	0.56	0.50	0.292	0.337
COVID Hesitancy Reasons - Vaccine Gives COVID	0.11	0.31	0.800	0.936
COVID Hesitancy Reasons - Produced Too Quickly	0.49	0.50	0.346	0.433
COVID Hesitancy Reasons - Not Effective	0.18	0.38	0.131	0.164
COVID Hesitancy Reasons - Not At Risk of Getting COVID	0.03	0.17	0.256	0.247
COVID Hesitancy Reasons - Against Vaccines Generally	0.03	0.17	0.141	0.145
COVID Hesitancy Reasons - Prefer 'Natural' Immunity	0.06	0.24	0.779	0.749
COVID Hesitancy Reasons - Already Had COVID	0.05	0.22	0.163	0.238
COVID Hesitancy Reasons - Don't Trust Government	0.33	0.47	0.036**	0.057*
COVID Hesitancy Reasons - Financial Concerns	0.10	0.30	0.700	0.608
COVID Hesitancy Reasons - Other	0.08	0.27	0.759	0.802
Comorbidities - None	0.44	0.50	0.667	0.936
Comorbidities - Diabetes	0.16	0.36	0.325	0.228
Comorbidities - Cardiovascular Diseases	0.15	0.36	0.059*	0.055*
Comorbidities - Obesity	0.25	0.43	0.732	0.906
Comorbidities - Autoimmune Diseases	0.06	0.24	0.769	0.847
Comorbidities - Chronic Obstructive Pulmonary Disease	0.06	0.25	0.445	0.515
Comorbidities - Prefer Not To Share	0.03	0.17	0.974	0.905
Had COVID	0.09	0.29	0.235	0.275
Know Someone Seriously Ill or Passed Away COVID	0.70	0.46	0.828	0.691
COVID Economic Situation	2.26	0.86	0.224	0.256
Government Vaccine Priority	3.28	1.17	0.001***	0.003***
Left/Right Political Scale	5.20	2.05	0.399	0.416
Satisfied with President COVID Management	2.19	1.37	0.552	0.551
Satisfied with Mayor COVID Management	2.59	1.27	0.543	0.559
Satisfied with Health Ministry COVID Management	2.40	1.27	0.411	0.378
Would Vote for Current President	0.21	0.40	0.807	0.772
Would Vote for Current Mayor	0.24	0.43	0.252	0.275
Trust in Current President	1.99	1.11	0.531	0.461
Trust in Current Mayor	2.27	1.03	0.866	0.692
Trust in National Health Ministry	2.25	1.05	0.242	0.260
Trust in National Medical Association	2.90	0.93	0.244	0.367
Trust in Left-Wing Newspaper	2.17	0.94	0.643	0.825
Trust in Right-Wing Newspaper	2.18	0.98	0.717	0.897
Trust in Religious Leader	2.04	0.92	0.764	0.876
Trust in Local Healthcare	3.09	0.85	0.638	0.822
Trust in Armed Forces	2.79	1.03	0.394	0.280
Trust in Civil Society Organizations	2.62	0.82	0.526	0.490
Trust in Government of China (baseline)	1.89	0.86	0.258	0.345
Trust in Government of US Under Trump (baseline)	1.81	0.94	0.300	0.375
Trust in Government of US Under Biden (baseline)	2.46	0.91	0.798	0.743
Trust in Government of UK (baseline)	2.46	0.89	0.724	0.743
Trust in Government of Russia (baseline)	2.25	0.93	0.737	0.897
Meeting Indoor With Non-Family Contributes to COVID	3.42	0.94	0.687	0.611
Risk Aversion	0.97	0.66	0.615	0.552
Discount Rate	3.29	0.81	0.080*	0.153
Donation Amount	0.48	0.31	0.202	0.295
Important to Receive Respect and Recognition	2.66	1.01	0.107	0.198
Social Influence	2.28	0.86	0.621	0.869
Vaccine Information Treatment	0.21	0.41	0.575	0.507
Vaccine Information Treatment with Biden Endorsement	0.14	0.35	0.164	0.157
Vaccine Information Treatment with Expert Herd Immunity Prediction (60%)	0.07	0.25	0.664	0.798
Vaccine Information Treatment with Expert Herd Immunity Prediction (70%)	0.08	0.27	0.290	0.351
Vaccine Information Treatment with Expert Herd Immunity Prediction (70%)	0.07	0.26	0.885	0.830
Vaccine Information Treatment with Expert Herd Immunity Prediction (60%) and Current Willingness	0.08	0.27	0.614	0.540
Vaccine Information Treatment with Expert Herd Immunity Prediction (70%) and Current Willingness	0.07	0.25	0.955	0.874
Vaccine Information Treatment with Expert Herd Immunity Prediction (80%) and Current Willingness	0.08	0.27	0.302	0.280
Motivation Treatment - Altruism	0.25	0.43	0.061*	0.073*
Motivation Treatment - Economic Recovery	0.23	0.42	0.282	0.248
Motivation Treatment - Social Approval	0.25	0.43	0.818	0.880

Note: Each statistic is the p value associated with an F test of the null hypothesis that the mean value across treated and control respondents who answered the post-treatment trust question is the same, based on an OLS regression including experimental block $\times$ respondent country fixed effects and and (for the final column) country-specific indicators for each level of pre-treatment baseline survey trust. p values do not exist for the variables used to define blocks.

Table A10: The effect of aggregate vaccine distribution information treatment on trust in foreign governments, by respondent country

	Outcome: trust in foreign government scale (all governments)					
	Argentinean respondents (1)	Brazilian respondents (2)	Chilean respondents (3)	Colombian respondents (4)	Mexican respondents (5)	Peruvian respondents (6)
Panel A: Average treatment effect						
Treated	0.010	-0.053	0.080***	0.116*	0.034	-0.009
	(0.030)	(0.040)	(0.024)	(0.060)	(0.033)	(0.045)
R^2	0.61	0.56	0.52	0.64	0.59	0.59
Panel B: Heterogeneity by rank of vaccines received by the respondent's country						
Treated × Reversed rank	0.052**	0.054*	0.066***	0.063	0.059**	0.010
	(0.022)	(0.029)	(0.017)	(0.042)	(0.023)	(0.035)
R^2	0.61	0.56	0.53	0.64	0.60	0.59
Reversed rank range	[1.5,5]	[1.5,5]	[1.5,5]	[1.5,5]	[1,5]	[2,5]
Reversed rank mean	3.00	3.00	3.00	3.00	3.00	3.00
Reversed rank std. dev.	1.38	1.38	1.38	1.38	1.41	1.27
Panel C: Heterogeneity by the share of vaccines received by the respondent's country						
Treated × Share	0.239*	0.288*	0.299***	0.462*	0.533***	0.031
	(0.126)	(0.167)	(0.074)	(0.274)	(0.192)	(0.132)
R^2	0.61	0.56	0.53	0.64	0.60	0.59
Share range	[0,0.6]	[0,0.53]	[0,0.84]	[0,0.55]	[0,0.46]	[0,0.85]
Share mean	0.20	0.20	0.19	0.20	0.20	0.20
Share std. dev.	0.24	0.24	0.33	0.22	0.17	0.33
Panel D: Heterogeneity by rank of vaccines received by the respondent's country relative to prior belief						
Treated × Reversed rank ≥ Reversed prior	0.031	0.044	0.220***	0.166	-0.021	0.200**
	(0.064)	(0.081)	(0.050)	(0.122)	(0.070)	(0.094)
R^2	0.61	0.56	0.53	0.64	0.60	0.59
Reversed rank ≥ Reversed prior range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Reversed rank ≥ Reversed prior mean	0.64	0.57	0.65	0.60	0.62	0.61
Reversed rank ≥ Reversed prior std. dev.	0.48	0.50	0.48	0.49	0.48	0.49
Panel E: Heterogeneity by rank of vaccines received by the respondent's country and prior beliefs						
Treated × Reversed rank	0.032	0.054*	0.071***	0.079	0.046*	0.022
	(0.026)	(0.030)	(0.020)	(0.049)	(0.024)	(0.037)
Treated × Reversed prior	0.037	0.000	-0.008	-0.040	0.046*	-0.030
	(0.024)	(0.027)	(0.019)	(0.042)	(0.025)	(0.033)
R^2	0.61	0.56	0.53	0.64	0.60	0.59
Reversed prior range	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]
Reversed prior mean	3.10	3.17	3.06	3.09	3.08	3.05
Prior belief SD	1.52	1.52	1.50	1.53	1.45	1.49
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}
Control outcome mean	2.47	2.49	2.39	2.54	2.68	2.63
Control outcome std. dev.	0.92	0.99	0.92	0.97	0.95	0.89
Observations	1,500	1,170	2,935	425	1,405	810

Notes: The specification in each column of each panel includes experimental block × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment endline survey trust, and is estimated using OLS. Covariates and lower-order interaction terms in panels B-D are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: The effect of aggregate vaccine distribution information treatment on trust in foreign governments, by respondent country

	Outcome: some or a lot of trust in foreign government indicator (all governments)					
	Argentinean respondents (1)	Brazilian respondents (2)	Chilean respondents (3)	Colombian respondents (4)	Mexican respondents (5)	Peruvian respondents (6)
Panel A: Average treatment effect						
Treated	-0.018	-0.017	0.032**	0.084**	0.038**	0.032
	(0.019)	(0.022)	(0.014)	(0.036)	(0.019)	(0.026)
R^2	0.48	0.46	0.46	0.54	0.50	0.50
Panel B: Heterogeneity by rank of vaccines received by the respondent's country						
Treated × Reversed rank	0.022	0.043***	0.033***	0.046*	0.029**	0.010
	(0.013)	(0.016)	(0.010)	(0.027)	(0.013)	(0.020)
R^2	0.49	0.46	0.46	0.55	0.50	0.50
Reversed rank range	[1.5,5]	[1.5,5]	[1.5,5]	[1.5,5]	[1,5]	[2,5]
Reversed rank mean	3.00	3.00	3.00	3.00	3.00	3.00
Reversed rank std. dev.	1.38	1.38	1.38	1.38	1.41	1.27
Panel C: Heterogeneity by the share of vaccines received by the respondent's country						
Treated × Share	0.089	0.217**	0.152***	0.313*	0.266**	0.059
	(0.078)	(0.092)	(0.042)	(0.173)	(0.109)	(0.074)
R^2	0.49	0.46	0.46	0.55	0.50	0.50
Share range	[0,0.6]	[0,0.53]	[0,0.84]	[0,0.55]	[0,0.46]	[0,0.85]
Share mean	0.20	0.20	0.19	0.20	0.20	0.20
Share std. dev.	0.24	0.24	0.33	0.22	0.17	0.33
Panel D: Heterogeneity by rank of vaccines received by the respondent's country relative to prior belief						
Treated × Reversed rank ≥ Reversed prior	0.016	0.042	0.116***	0.137*	0.018	0.085
	(0.039)	(0.046)	(0.029)	(0.074)	(0.040)	(0.055)
R^2	0.48	0.46	0.46	0.55	0.50	0.50
Reversed rank ≥ Reversed prior range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}
Reversed rank ≥ Reversed prior mean	0.64	0.57	0.65	0.60	0.62	0.61
Reversed rank ≥ Reversed prior std. dev.	0.48	0.50	0.48	0.49	0.48	0.49
Panel E: Heterogeneity by rank of vaccines received by the respondent's country and prior beliefs						
Treated × Reversed rank	0.012	0.043***	0.037***	0.063**	0.023	0.014
	(0.016)	(0.016)	(0.012)	(0.031)	(0.014)	(0.021)
Treated × Reversed prior	0.019	0.005	-0.009	-0.039	0.020	-0.010
	(0.014)	(0.015)	(0.010)	(0.026)	(0.014)	(0.019)
R^2	0.49	0.46	0.46	0.55	0.51	0.50
Reversed prior range	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]	[1,5]
Reversed prior mean	3.10	3.17	3.06	3.09	3.08	3.05
Prior belief SD	1.52	1.52	1.50	1.53	1.45	1.49
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}
Control outcome mean	2.47	2.49	2.39	2.54	2.68	2.63
Control outcome std. dev.	0.92	0.99	0.92	0.97	0.95	0.89
Observations	1,500	1,170	2,935	425	1,405	810

Notes: The specification in each column of each panel includes experimental block × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment endline survey trust, and is estimated using OLS. Covariates and lower-order interaction terms in panels B-D are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

indicated ties or straight-lined this question. To ensure that our results are not driven by the 28% of respondents who did not provide unique rankings, column (2) demonstrates that the results are robust to excluding these respondents.

Third, column (3) reports the experimental results using ordered logit and logit estimators for the scale and binary trust outcome variables, respectively. Although the point estimates of course change, the results continue show clear and statistically significant effects on trust.

Finally, column (4) of each table reports the experimental results, reweighting to match observable characteristics of the population. We again report estimates that reweight observations to match the marginal population distribution; this method is described in Section A.4.3. The results suggests that the unweighted effects in our sample are relatively similar to the reweighted effects.

A.5.4 Additional mechanism results

Table A14 reports the results for the binary trust outcome of our mechanism test splitting respondents with a public good orientation from respondents primarily perceiving cynical motives for a given country.

Table A12: The effect of aggregate vaccine distribution information treatment on trust in foreign governments, outcome scale—robustness tests for specifications pooling across foreign governments

	Outcome: trust in foreign government scale			
	Adjusting for imbalanced covariates	Excluding non-unique rankings	(Ordered) logit estimation	Rake population weights
	(1)	(2)	(3)	(4)
Panel A: Average treatment effect				
Treated	0.050**	0.059**	0.091	0.030
	(0.021)	(0.023)	(0.061)	(0.031)
R^2	0.58	0.59		0.59
Panel B: Heterogeneity by rank of vaccines received by the respondent's country				
Treated × Reversed rank	0.051***	0.052**	0.176***	0.044***
	(0.009)	(0.010)	(0.027)	(0.012)
R^2	0.58	0.60		0.59
Reversed rank range	[1,5]	[1,5]	[1,5]	[1,5]
Reversed rank mean	3.00	3.00	3.00	3.00
Reversed rank std. dev.	1.37	1.37	1.38	1.37
Panel C: Heterogeneity by the share of vaccines received by the respondent's country				
Treated × Share	0.248***	0.276***	0.840***	0.223***
	(0.047)	(0.051)	(0.139)	(0.059)
R^2	0.58	0.60		0.59
Share range	[0,0.85]	[0,0.85]	[0,0.85]	[0,0.85]
Share mean	0.19	0.19	0.19	0.19
Share std. dev.	0.27	0.27	0.27	0.27
Panel D: Heterogeneity by rank of vaccines received by the respondent's country relative to prior belief				
Treated × Reversed rank ≥ Reversed prior	0.092***	0.100***	0.351***	0.090**
	(0.031)	(0.034)	(0.089)	(0.043)
R^2	0.58	0.60		0.59
Reversed rank ≥ Reversed prior range	{0,1}	{0,1}	{0,1}	{0,1}
Reversed rank ≥ Reversed prior mean	0.63	0.63	0.65	0.63
Reversed rank ≥ Reversed prior std. dev.	0.48	0.48	0.48	0.48
Panel E: Heterogeneity by rank of vaccines received by the respondent's country and prior beliefs				
Treated × Reversed rank	0.049***	0.051***	0.169***	0.053***
	(0.012)	(0.014)	(0.031)	(0.010)
Treated × Reversed prior	0.005	0.008	0.016	0.006
	(0.011)	(0.013)	(0.033)	(0.011)
R^2	0.58	0.60		0.57
Reversed prior range	[1,5]	[1,5]	[1,5]	[1,5]
Reversed prior mean	3.09	3.08	3.00	3.09
Reversed prior std. dev.	1.50	1.50	1.41	1.50
Outcome range	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}	{1,2,2.5,3,4}
Control outcome mean	2.51	2.51	2.50	2.47
Control outcome std. dev.	0.94	0.94	0.94	0.93
Observations	7,430	6,010	8,245	8,060

Notes: The specification in each column of each panel includes experimental block × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment endline survey trust. The specifications in column (1) adjusts for the imbalanced covariates from Table A9, and are estimated using OLS. The specifications in column (2) exclude respondents with non-unique prior rankings, and are estimated using OLS. The specifications in column (3) are estimated using ordered logit. The specifications in column (4) is estimated using WLS; the weights reflect the country-specific marginal distribution in terms of age category, education level, region, gender, and socioeconomic class. Covariates and the lower-order interaction terms in panels B-E are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A13: The effect of aggregate vaccine distribution information treatment on trust in foreign governments, binary outcome—robustness tests for specifications pooling across foreign governments

	Outcome: trust in foreign government scale			
	Adjusting for imbalanced covariates (1)	Excluding non-unique rankings (2)	(Ordered) logit estimation (3)	Rake population weights (4)
Panel A: Average treatment effect				
Treated	0.024**	0.024*	0.164*	0.030*
	(0.012)	(0.014)	(0.088)	(0.018)
R^2	0.48	0.49		0.50
Panel B: Heterogeneity by rank of vaccines received by the respondent's country				
Treated × Reversed rank	0.028***	0.029***	0.237***	0.023***
	(0.005)	(0.006)	(0.040)	(0.008)
R^2	0.48	0.49		0.50
Reversed rank range	[1,5]	[1,5]	[1,5]	[1,5]
Reversed rank mean	3.00	3.00	3.00	3.00
Reversed rank std. dev.	1.37	1.38	1.37	1.37
Panel C: Heterogeneity by the share of vaccines received by the respondent's country				
Treated × Share	0.131***	0.141***	1.155***	0.110***
	(0.027)	(0.030)	(0.197)	(0.038)
R^2	0.48	0.49		0.50
Share range	[0,0.85]	[0,0.85]	[0,0.85]	[0,0.85]
Share mean	0.19	0.19	0.19	0.19
Share std. dev.	0.27	0.27	0.27	0.27
Panel D: Heterogeneity by rank of vaccines received by the respondent's country relative to prior belief				
Treated × Reversed rank $\geq$ Reversed prior	0.057***	0.061***	0.526***	0.044
	(0.018)	(0.020)	(0.129)	(0.027)
R^2	0.48	0.49		0.50
Reversed rank $\geq$ Reversed prior range	{0,1}	{0,1}	{0,1}	{0,1}
Reversed rank $\geq$ Reversed prior mean	0.63	0.65	0.63	0.63
Reversed rank $\geq$ Reversed prior std. dev.	0.48	0.48	0.48	0.48
Panel E: Heterogeneity by rank of vaccines received by the respondent's country and prior beliefs				
Treated × Reversed rank	0.028***	0.028***	0.235***	0.030***
	(0.007)	(0.008)	(0.044)	(0.006)
Treated × Reversed prior	0.000	0.003	0.005	0.001
	(0.006)	(0.008)	(0.045)	(0.006)
R^2	0.49	0.57		0.48
Reversed prior range	[1,5]	[1,5]	[1,5]	[1,5]
Reversed prior mean	3.08	3.00	3.08	3.09
Reversed prior std. dev.	1.50	1.41	1.49	1.50
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}
Control outcome mean	0.48	0.48	0.47	0.46
Control outcome std. dev.	0.50	0.50	0.50	0.50
Observations	7,430	6,010	8,245	8,060

Notes: The specification in each column of each panel includes experimental block × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment endline survey trust. The specifications in column (1) adjusts for the imbalanced covariates from Table A9, and are estimated using OLS. The specifications in column (2) exclude respondents with non-unique prior rankings, and are estimated using OLS. The specifications in column (3) are estimated using logit. The specifications in column (4) is estimated using WLS; the weights reflect the country-specific marginal distribution in terms of age category, education level, region, gender, and socioeconomic class. Covariates and the lower-order interaction terms in panels B-E are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A14: The pooled effect of the aggregate vaccine distribution information treatment on trust in foreign governments across public good-oriented and cynical respondents, binary outcome

	Outcome: some or a lot of trust in foreign government indicator				
	(1)	(2)	(3)	(4)	(5)
Panel A: Public good respondents					
Treated	0.043***	-0.149**	-0.006	-0.026	-0.123*
	(0.015)	(0.068)	(0.023)	(0.031)	(0.072)
Treated × Reversed rank		0.049***			0.051***
		(0.017)			(0.017)
Treated × Share			0.153***		
			(0.051)		
Treated × Reversed rank ≥ reversed prior				0.090**	
				(0.036)	
Treated × Reversed prior					-0.010
					(0.012)
R^2	0.44	0.44	0.44	0.44	0.44
Control outcome mean	0.63	0.63	0.63	0.63	0.63
Control outcome std. dev.	0.48	0.48	0.48	0.48	0.48
Moderator range		[2,5]	[0,0.85]	{0,1}	[2,5], [1,5]
Moderator mean		3.94	0.32	0.77	3.94, 3.50
Moderator std. dev.		0.90	0.30	0.42	0.89, 1.40
Observations	2,446	2,446	2,446	2,446	2,446
Panel B: Cynical respondents					
Treated	0.046***	-0.048	0.022	0.069**	-0.092
	(0.015)	(0.072)	(0.022)	(0.035)	(0.073)
Treated × Reversed rank		0.023			0.010
		(0.018)			(0.019)
Treated × Share			0.076		
			(0.051)		
Treated × Reversed rank ≥ reversed prior				-0.030	
				(0.099)	
Treated × Reversed prior					0.028**
					(0.011)
R^2	0.48	0.48	0.48	0.48	0.48
Control outcome mean	0.35	0.35	0.35	0.35	0.35
Control outcome std. dev.	0.48	0.48	0.48	0.48	0.48
Moderator range		[2,5]	[0,0.85]	{0,1}	[2,5], [1,5]
Moderator mean		3.99	0.31	0.8	3.99, 3.43
Moderator std. dev.		0.85	0.29	0.40	0.85, 1.41
Observations	2,488	2,488	2,488	2,488	2,488
Outcome range	{0,1}	{0,1}	{0,1}	{0,1}	{0,1}

Notes: The specification in each column of each panel includes experimental block × respondent country × vaccine-developer country fixed effects and country-specific indicators for each level of pre-treatment endline survey trust, and is estimated using OLS. Moderator descriptive statistics in column 5 reflect reversed rank and reversed prior, respectively. Covariates are omitted to save space. Standard errors clustered by respondent are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.