The University of Chicago

(Mis)using Global Vaccine Inequality:

An Analysis of the Global Political Economy of Bilateral COVID-19 Vaccine Donations

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Abstract

The global inequality in vaccines has led countries with an abundance of vaccines to donate vaccines to countries in need. These vaccine donations were not only provided out of pure altruism but were part of vaccine diplomacy. This thesis finds through descriptive case studies and quantitative research that political factors were often more important than factors of need in the determination of who to donate vaccines to. For China, political alignment was an important factor, just as GDP per capita, Taiwan relations, whether they are part of the Belt and Road Initiative, and geographical distance. For the United States, the pre-existing trade relations and whether a country is democratic were important. And India primarily donated to countries that politically align with them, are democratic, support Taiwan, and have a large Indian diaspora. These findings extend the literature on bilateral foreign aid and provides a better understanding of the global political economy of vaccine donations. Overall, the conclusion is that, even though vaccine donations have helped countries in need significantly, it was primarily an extension of the donor countries' foreign policy.

Keywords: COVID-19, vaccines, political economy, vaccine diplomacy, global inequality, vaccine donations, determinants, foreign aid, foreign policy, bilateralism, COVAX, China, United States, India

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Introduction

The COVID-19 pandemic has had an immense impact on the globe and international politics. The field of political science and international relations will have to contextualize the consequences and influence of the COVID-19 pandemic for years in the near future. One specific phenomenon that has been apparent during the COVID-19 pandemic is global vaccine inequality. There are many questions that one could ask about this global vaccine inequality, for example, how did this happen or why do some countries have better access to vaccines than other countries? Even though these questions are vital and challenging, this thesis will rather focus itself on how countries acted within this context of global vaccine inequality. What did countries do when the world was in one of its most vulnerable moments in recent history? More specifically, this thesis will focus on the global political economy of vaccine donations. The main question of this research is *what is the global political economy behind vaccine donations?* With a more specific question that regards *what are the determinants of the distribution of vaccine donations and what is the role of vaccine diplomacy within the global political economy of vaccines?*

When it comes to the global political economy of vaccines, there seem to be three main ways that vaccines are distributed. Either by multilateral donations, bilateral donations, or trade. This thesis explicitly chooses to solely focus on donations. Many vaccines in the world are donated through a multilateral approach with COVAX. This thesis will not focus on these donations but only on the donations that are conducted bilaterally. Furthermore, the countries that will be used in the analysis are *China*, *the United States*, and *India*. The reasons for this are

because they are a few of the biggest donors of vaccines, their vaccine strategies are the most explicit and their data on vaccine donations is the most accessible. These three countries together entail 55% of the total delivered vaccine donations and 59% of the total delivered bilateral vaccine donations (UNICEF, 2022). China and the United States are the biggest bilateral vaccine donors, while only Australia and Japan are ahead of India (UNICEF, 2022).

Within this thesis, it will be examined what the most important determinants are for a donor country to donate vaccines to another country. Is this because of the need that a recipient country has or is it rather because of political reasons? The overarching theory and hypothesis that will be tested is that *bilateral vaccine donations during the COVID-19 crisis are an extension of a country's foreign policy strategy*. These foreign policy strategies will differ per country, therefore, the main theoretical contribution of this thesis is to extend the bilateral foreign aid literature by providing an analysis of how global powers—more specifically, China, the United States, and India—acted in one of the most dire global moments in recent history—the COVID-19 pandemic. The COVID-19 health crisis exposed a world where some had plenty of resources while others had none. Through analyzing the actions of countries during the COVID-19 crisis, this thesis theorizes the global political economy, more specifically, the political economy of foreign aid. Through the analysis, it becomes apparent that foreign aid is an extension of foreign policy because political reasons appear to be more important in the selection of who to donate vaccines to than the actual need of countries.

To provide such an analysis, the methodology is constructed as a mixed methods design with a qualitative and quantitative part. It will conduct qualitative research through descriptive case studies and theorize the strategies of different vaccine powers and how they have approached vaccine distribution. Throughout this qualitative analysis—in combination with the

overall literature review—this thesis will single out different hypotheses and variables that are either motivated by need or political reasons to use within a quantitative analysis, where the theory of the qualitative research will be tested.

The structure of this thesis will commence by, first, conducting a literature review to provide an overview of the existing literature surrounding vaccine diplomacy. Second, a qualitative analysis of descriptive case studies will be conducted on the vaccine diplomacy of China, the United States, and India. Throughout the literature review and qualitative analysis, theory and hypotheses will be extracted. Third, this theory will be used to create variables and conduct a quantitative analysis. Fourth, a discussion and conclusion will be conducted.

Literature Review

The COVID-19 pandemic has had an immense effect on the health of people around the world. As of July 2022, over 6.3 million people died from COVID-19 and there were over 575.5 million cases (Johns Hopkins Coronavirus Resource Center, 2022). At the beginning of the pandemic, primarily richer nations invested in companies to make vaccines but also hoarded as many vaccines as possible to be able to provide vaccines to their population (Tatar, Shoorekchali, Faraji, & Wilson, 2021; Oehler & Vega, 2021, p. 1). As a result of this hoarding, vaccines were rather concentrated in the world, which meant that some countries would be able to vaccinate their population multiple times, while other countries would not even be able to vaccinate their health care workers (Tatar et al., 2021; Oehler & Vega, 2021, p. 2). This hoarding of vaccines and not distributing them around the world could be conceptualized as *vaccine nationalism*. "Vaccine nationalism is the prioritization of the domestic needs of the country in an outlay of others" (Lagman, 2021, p. 375). Countries perceive this prioritization of themselves as something that increases their own protection from the virus and they, therefore, purchase and

hoard supplies of the vaccine for their utilization (Lagman, 2021, p. 375). However, according to several authors, this vaccine nationalism is largely counter-effective considering that it perpetuates the COVID-19 crisis, leaves the door open for viral evolution because of a continuation of transmissions, e.g. the omicron variant, and makes it harder to return to a pre-pandemic sense of normalcy (Oehler & Vega, 2021, pp. 1-2; Asundi, O'Leary, & Bhadelia, 2021, pp. 1036-1037; Hassan, London, & Gonsalves, 2021; Lagman, 2021, p. 375)

The Political Economy of Vaccines

Even though vaccine nationalism was prevalent at the beginning of the pandemic, eventually countries started to distribute vaccines (Su, McDonnell, Li, Bennett, Šegalo, Abbas, Cheshmehzangi, & Xiang, 2021). This literature review examines how the vaccines are distributed between countries, in other words, the political economy of vaccines, and distills three different ways that vaccines flow between countries, namely a multilateral approach, donations, and trade (Su et al., 2021; Cornish & Ravelo, 2021).

The first approach would be that there have been multilateral attempts at distributing vaccines, most prominently the COVAX initiative (Su et al., 2021, p. 3). COVAX is the scheme led by the World Health Organization (WHO), Gavi, and the Coalition for Epidemic Preparedness Innovations (CEPI) "to support research and development, raise funding, and negotiate the bulk purchase and equitable global distribution of vaccines for COVID-19" (The Lancet, 2021, p. 941). The idea of COVAX is that governments and philanthropists have funded vaccine developers to help mitigate the risks of product development because incentives were needed to scale up manufacturing to meet the global demand (Kettler, 2021). In order to reach this, COVAX "has been negotiating advance deals across a broad portfolio of COVID-19 vaccines, including, in a few cases, pre-payments to increase manufacturing capacity" (Kettler,

2021). It positions itself as the global vaccine-sharing hub and distributes the vaccines from the donor countries in an equitable way to lower and middle-income countries (de Bengy Puyvallée & Storeng, 2022, p. 1).

Another approach is the phenomenon that countries provide bilateral donations of vaccines (Su et al., 2021, p. 3). Countries promise to directly provide vaccines to one other country without the influence of other countries or international organizations (Su et al., 2021, p. 3). Different countries take different approaches, for example, the United States has donated 87% of its donated vaccines through COVAX, while 13% directly (KFF, 2022). Meanwhile, countries like China, India, and Russia primarily use direct donations to countries (de Bengy Puyvallée & Storeng, 2022, p. 5; Cornish & Ravelo, 2021).

In the third approach, vaccines are purchased by countries from countries that already have vaccines, which could be considered trade (Cornish & Ravelo, 2021). So, in these cases, vaccine distribution occurs through bilateral agreements for which the receiving country has to pay (Cornish & Ravelo, 2021). These could be reduced prices but it could not be considered a donation in the sense of COVAX and bilateral donations because there is an exchange of currency in these cases (Cornish & Ravelo, 2021).

Vaccine Diplomacy

When it comes to bilateral donations—the focus of this thesis—its idea would be that they are done unilaterally with no reciprocal expectations. One could call this *vaccine empathy*—"an individual or a nation's capability to sympathize with other individuals or nations' vaccine wants and needs" (Su et al., 2021, p. 1). Vaccine empathy is characterized by not being self-interested and being guided by altruistic ideals (Su et al., 2021, p. 7). It is rather common to portray general foreign aid as something that is done out of the goodness of the donor country's

heart and has no political reason beyond that. Morgenthau (1962) theorizes this viewpoint of foreign aid as "an end in itself, carrying its own justification, both transcending, and independent of, foreign policy" (p. 301). According to him, there are multiple forms of foreign aid of which humanitarian foreign aid per se nonpolitical and given to victims of natural disasters, such as a pandemic like the COVID-19 crisis (Morgenthau, 1962, p. 301). Considering that the COVID-19 pandemic is a humanitarian crisis and countries rhetorically frame their vaccine donations as humanitarian foreign aid, one should expect the following hypothesis to be true

(1) Need for vaccines was for all countries a significant factor in the determination of vaccine donation allocation.

However, it could also be that vaccines are donated with other intentions than merely vaccine empathy. It might be that countries would like to see something in return, for example, political favors or to gain soft power (Pannu & Barry, 2021, p. 744; Su et al., 2021). Within the literature, these other self-interested and ulterior motives are defined as *vaccine diplomacy*, which "is a nation's vaccine efforts that aim to build mutually beneficial relationships with other nations" (Su et al., 2021, p. 1). According to Apodaca (2017), "states use foreign aid as a means of pursuing foreign policy objectives" (p. 1). She argues that, even though the overall increase in human welfare is one of the reasons for foreign aid, the main reason is to pursue its foreign policy goals (Apodaca, 2017, p. 1). According to Apodaca (2017), two ways that countries do this is by using aid as an incentive to coerce or reward countries or regimes into being friendly and compliant with the donor country, or by making a country dependent on the donor country and using it as a threat to withdraw foreign aid, which results in creating economic hardship in a country or destabilizing an unfriendly regime (p. 1).

Determinants of Bilateral Foreign Aid

Bilateral vaccine donations could be considered a form of bilateral foreign aid and thus its literature fits within the bilateral foreign aid literature. Within the bilateral foreign aid literature, there are several papers that research what the most important determinants are of the distribution of foreign aid. There is an abundance of country-specific literature, especially for China, but these will be discussed in the qualitative analysis and the literature will examine research on the overall determinants of foreign aid. Ali & Isse (2006) find that variables of need, like GDP per worker and years of schooling, are important in receiving aid because a country gets more foreign aid if they have less wealth or education, while foreign aid increases because of a lack of overall trade (Ali & Isse, 2006, p. 249). However, the methods of Ali & Isse (2006) could be considered rather questionable because they do not include any political variables in their research, while there is a rather large amount of bilateral foreign aid research that theorizes and concludes that political factors are rather important in the determination of foreign aid.

Werker (2012) makes the argument that empirical research has shown that the determinants of foreign aid are generally to a large extent politically motivated, but that what motivates one donor country might not motivate another (p. 5). For example, Schraeder, Hook, & Taylor (1998) found that France's aid rather often goes to francophone countries, Swedish aid generally supports progressive, socialist-minded regimes, and Japanese aid is more influenced by interests regarding trade (pp. 310-318). Neumayer (2003) found that foreign aid donors from the Gulf region generally favor other Arab and majority Muslim recipient nations. From this analysis, it would make sense to provide a cross-country empirical analysis of the determinants of foreign aid, in this case, vaccine donations, with both variables of need and political factors

and use several cases considering that political motivations—in this case, foreign policy goals like Apodaca (2017) suggests—could be different between donor countries.

Qualitative Analysis

In this section, descriptive case studies of China, the United States, and India will be conducted through an analysis of documents and scholarly texts to theorize the vaccine powers and how they have approached vaccine distribution. Every case study will be approached by (1) examining the numbers of the donor country's vaccine diplomacy, (2) describing their vaccine strategy and how this fits within their overall foreign policy strategy, and (3) reviewing country-specific empirical evidence on the determinants of bilateral foreign aid.

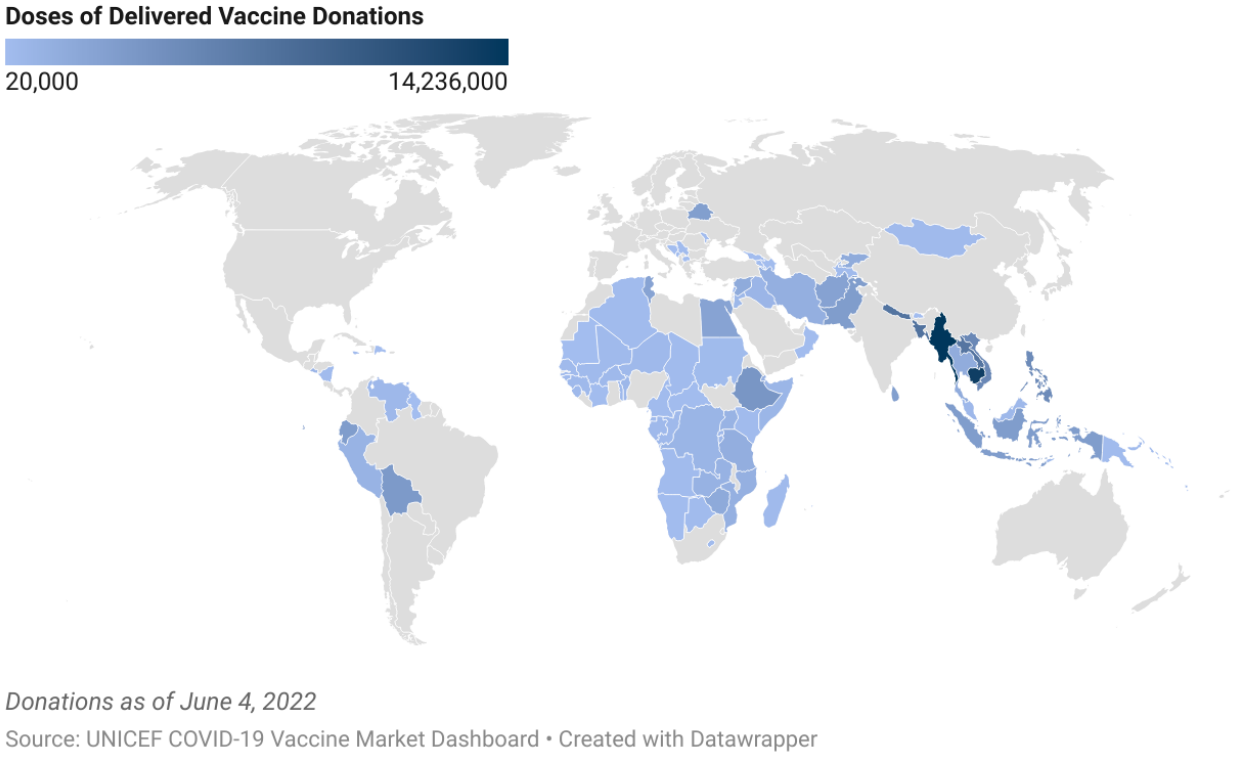
China

Having started in Wuhan, China was hit hard by the COVID-19 crisis. A health crisis that first seemed to be a domestic issue became a global pandemic that demanded global cooperation. China has been an important player in vaccine diplomacy surrounding the COVID-19 crisis. As of July 2022, China has sold 1.9 billion doses and pledged to donate 266 million doses, while having delivered 1.6 billion doses worldwide (Bridge Consulting, 2022). It becomes apparent that most donated doses go to Asia and to a lesser extent to Africa, Latin America, and Eastern Europe (see *Figure 1*). China's vaccine diplomacy strategy can be characterized by its primary choice for bilateral donations instead of taking a multilateral approach (Bridge Consulting, 2022). At the end of December 2020, the first batches of Sinovac vaccine delivery to Turkey and Indonesia occurred, which kickstarted China's global vaccine donations (Bridge Consulting, 2022).

That this thesis only analyzes bilateral donations and not trade is rather influential for the data of China. Even though China did donate quite some vaccines, the vast majority of its

vaccines were not donated but sold (Bridge Consulting, 2022). For example, the first spike in China's vaccine deliveries was because of India's vaccine export ban that was put in place because of a mounting domestic COVID-19 crisis (Bridge Consulting, 2022). China stepped in by announcing and quickly delivering vaccine doses, but these were primarily vaccine sales instead of donations to, for example, Indonesia, Brazil, Chile, and Mexico (Bridge Consulting, 2022). Even though vaccine donations are, of course, more pleasant than commercial orders, one should not underestimate the importance of commercial trade of vaccines for China's vaccine diplomacy. For many countries, the problem was not that they did not have enough money to buy vaccines, but that they just did not have enough access because of a global shortage and vaccine nationalism (Suzuki & Yang, 2022; Bridge Consulting, 2022). To be able to buy vaccines from China and get them delivered relatively quickly, initially helped China's vaccine diplomacy substantially (Suzuki & Yang, 2022, p. 8; CSIS, 2022). Other peaks in China's vaccine deliveries could be signaled in June and October 2021, which were respectively caused by the World Health Organization (WHO) giving the green light for Sinopharm and Sinovac for emergency use—together with an increase in global vaccine demand and new production facilities—and a large delivery to Iran combines with consistent deliveries to key recipient countries (Bridge Consulting, 2022).

Figure 1. Bilateral Vaccine Donations by China



Donations as of June 4, 2022

Source: UNICEF COVID-19 Vaccine Market Dashboard • Created with Datawrapper

When it comes to analyzing the vaccine strategy of China, the most prominent way would be to analyze the official press conferences conducted by the Chinese Ministry of Foreign Affairs. Kobierecka (2022) executed an extensive analysis of 81 press conferences that were held between April 1st and July 30th of 2021 (p. 2). According to Kobierecka (2022), the core goals of providing foreign aid as a strategy within China's previously existing foreign policy can be identified by the following characteristics, namely "providing conditions and space for international cooperation; presenting China as successful, responsible and dedicated actor, especially in providing assistance to developing countries; and providing mutual benefits (mostly economic)" (p. 5). The same kind of goals can be found in the press conferences of the Chinese Ministry of Foreign Affairs (Kobierecka, 2022, p. 9). It becomes evident in these speeches that China wants to portray itself as an advocate of international cooperation and solidarity, and as a responsible actor and provider of assistance to developing countries (Kobierecka, 2022, pp. 7-8).

Whereas Kobierecka (2022) uses the qualitative approach of analyzing official press conferences, Lee (2021) uses a case study approach to analyze China's vaccine diplomacy (p. 5). Notably, they both come to similar conclusions about the strategy and motivations behind China's efforts to provide vaccines to the world. Lee (2021) argues that the general motivations behind China's vaccine diplomacy could be categorized into five categories. First, she argues that one of the reasons China wants to donate vaccines is to repair its national brand that was hurt by its initial mishandling of the COVID-19 outbreak and attempt to transform its image to being a savior of the pandemic (Lee, 2021, p. 6). Second, she notes that China saw the soft power vacuum around vaccines as a result of vaccine nationalism by countries in Europe and North America as a geopolitical opportunity (Lee, 2021, p. 7). Third, when one analyzes speeches of the Chinese Ministry of Foreign Affairs, rather often the term 'international public good' (IPG) is used when China discusses that it wants to provide vaccines to the rest of the world (MFA, 2020a; MFA, 2020b). According to Zhao (2017), China has used the concept of international public goods in the past as a way to emphasize its global leadership and be a competitor to the United States in being the leader of the world (Lee, 2021, p. 8). Fourth, even though China has donated quite a few vaccines, the primary way that they shared vaccines was through commercial purchases or loans to buy vaccines (Lee, 2021, p. 8). China used a mixed model of business and politics by, for example, often providing some free doses to a country while after that striking a big deal (Lee, 2021, p. 9; Karásková and Blablová, 2021; Suzuki & Yang, 2022, pp. 8-9). Therefore, one could hypothesize that

(2) China donates more vaccines to countries that they have a higher trade level with.

And fifth, the vaccine diplomacy strategy is used as a continuation of its brand building as a country that was already rather active within health diplomacy in developing countries and leveraging its existing relationships (Lee, 2021, p. 9).

One aspect that has characterized China's vaccine diplomacy is that they explicitly ask leaders of countries to display public gratitude for the vaccine deliveries (CSIS, 2022). As of March 2022, at least 84 countries showed public gratitude by government officials for deliveries of Chinese vaccines, of which five countries even sent their presidents of prime ministers—Comoros, Czech Republic, Lesotho, Hungary, Serbia, and Zimbabwe (CSIS, 2022). Furthermore, 26 heads of state or government have been publicly vaccinated with Chinese vaccines (CSIS, 2022).

Another characteristic of Chinese vaccine diplomacy is that sometimes explicit political objectives are apparent. There are multiple examples of how a potential motivation for Chinese donations is to ensure or incentivize support for China's positions on Hong Kong, Taiwan, Tibet, and Xinjiang (Kiernan, Tohme, Shanks, & Rosenbaum, 2021). For example, Dominica and Guyana reaffirmed their commitments to the 'One China Policy'—not recognizing Taiwan as an independent country—after they had accepted donations (Kiernan et al., 2021). Guyana rolled back its plan to open a Taiwan office in the country (Reuters & CNN, 2021). And Nicaragua even cut ties with Taiwan, which resulted in a donation of 200,000 vaccine doses by China to Nicaragua less than a week later (BBC, 2021). This does not only occur in Latin America considering that Egypt and Kyrgyzstan supported China's positions on Xinjiang—the region where most Uygurs live—and then received vaccine donations (Kiernan et al., 2021).

The case of Paraguay is rather compelling for the purpose of qualitative analysis. Paraguay is one of the 15 countries that recognizes Taiwan and they were in desperate need of

COVID-19 vaccines in April 2020, which could supply (Londoño, 2021). This has led to Paraguay reconsidering its relationship with Taiwan, which precludes it from dealing with China (Londoño, 2021). The leftist bloc in the Senate of Paraguay introduced a bill to cut ties with Taiwan and open relations with China (Lee, 2021, p. 9). The argument of the proponents of the bills was that this would be crucial in receiving Chinese support in vaccines, masks, ventilators, investment, and trade (Lee, 2021, p. 9). The proposal did not make it but the opposition vowed to recognize China if they would get into power (Lee, 2021, p. 9). Taiwan is still not recognized by Paraguay but this also means that they have not received vaccines from China. It is a clear example of where vaccine donation distribution is not based on need by on the political foreign policy goals of China.

Another example of how the vaccine diplomacy of China influences relations is the example of Huawei in Brazil. Brazil took President Trump's side in shunning Huawei from its auction for their 5G wireless network worth billions of dollars (Londoño & Casado, 2021). However, after receiving vaccines through commercial sales from China, Huawei, which the government appeared to have barred just months before, was allowed to participate again (Londoño & Casado, 2021).

When one analyzes these countries from whom China was able to extract favors, it is interesting to see whether they targeted countries that were already existing friends or more marginal. This paper uses the variable of UN Voting Alignment as a proxy for political alignment. When one analyzes the countries that provided favors to China in exchange for vaccines—Dominica, Guyana, Nicaragua, Egypt, Kyrgyzstan, and Brazil—it becomes apparent that China generally targets countries to extract favors from whom are more politically aligned in comparison with their region. For example, Dominica, Guyana, Nicaragua, and Brazil are on

average more politically aligned to China (0.878) than the rest of Latin America (0.869). The same phenomenon is found for Egypt and Kyrgyzstan (0.895) in comparison with the MENA region and Eurasia (0.854). In other words, China seems to have been more able to extract objectives from countries that already have high political alignment with China. Overall, it also seems like China primarily donates vaccines to traditional allies, rather than bringing new countries under their orbit, considering at their average political alignment with countries that they donated to (0.88) is higher than the overall UN Voting Alignment score (0.82) that is already rather high for a scale from 0 to 1. Considering this analysis and the importance of Taiwan in China's foreign policy, one should expect that

(3) China donates more vaccines to countries that politically align with them.

(4) China donates fewer vaccines to countries that recognize Taiwan.

Next to China's sovereignty being a central part of its foreign policy, especially when it comes to Taiwan, the Belt and Road Initiative (BRI) is also central to its international diplomacy. It was launched in 2013 with intentions to develop a new Silk Road Economic Belt and a twenty-first century Maritime Silk Road (Jenkins, 2021, p. 13). At first, countries in Asia, Africa, and Eastern Europe were involved, but since 2018 also Latin American countries were incorporated into the initiative (Chiodi & Thu Nguyen, 2022). The BRI is one of the largest investment projects in the world and the economic and political benefits it gets from it are vital to its foreign policy (CSIS, 2020). Because of this importance, the hypothesis would be that

(5) China donates more vaccines to countries that are part of the Belt and Road Initiative.

As the literature review on bilateral foreign aid suggested, bilateral foreign aid is for a large part driven by political concerns, and these political concerns can differ between donor

countries (Werker, 2012). There is quite some literature on the determinants of Chinese foreign aid. According to Dreher & Fuchs (2015), China's allocation of overall aid seems to be highly influenced by geopolitical considerations, for example, countries that vote in line with China in the United Nations General Assembly and do not recognize Taiwan get a significantly higher amount in foreign aid (see *Hypotheses 3 & 4*) (pp. 1018-1019). The research of Dreher & Fuchs regarded all kinds of foreign aid over a larger period, but there is also literature that is more specific to this thesis because it regards Chinese foreign aid regarding medical supplies. Before vaccines were available for use, the COVID-19 pandemic caused a crisis in medical supplies, like masks and ventilators, in many countries. Telias & Urdinez (2022) find in their research that the allocation of masks was primarily influenced by the partnership status that a recipient country has with China and whether a country recognizes Taiwan (see *Hypotheses 3 & 4*) (p. 126). They also find that China tended to give more masks to more autocratic countries (Telias & Urdinez, p. 129). They argue that this finding could support "the argument that China uses aid to promote a 'Beijing Model' of autocratic development" (Telias & Urdniez, p. 129). Therefore, one could expect that

(6) China donates more vaccines to more autocratic regimes.

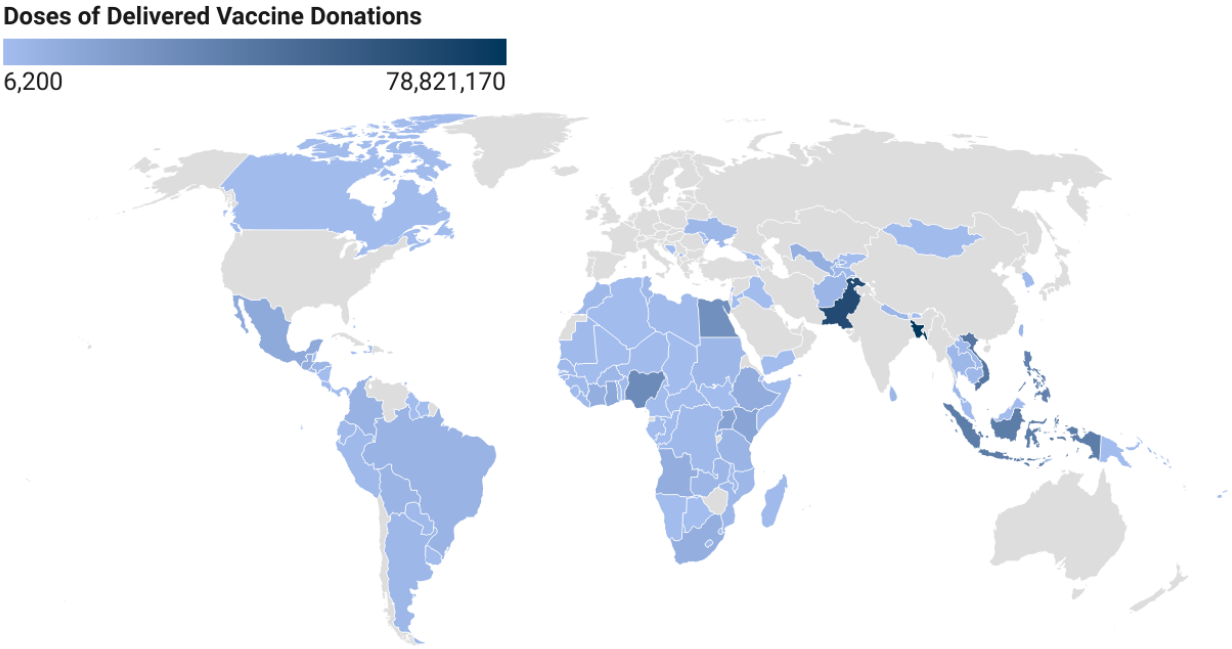
Fuchs, Kaplan, Kis-Katos, Schmidt, Turbanisch, & Wang (2020) find in their research regarding medical supply aid by China during the COVID-19 crisis that past medical commercial exports—hence past commercial ties—are an important determinant for whether countries were able to obtain medical supplies during the COVID-19 crisis (see *Hypothesis 2*) (p. 13). However, when it comes to donations, past donations of medical exports, but more importantly, whether a country recognizes Taiwan or has sister linkages with Chinese provinces are influential determinants of whether a country would receive medical supply donations (see

Hypotheses 3) (Fuchs et al., 2020, p. 24). They argue that "these findings imply that, to secure access to Chinese medical equipment in crises, countries are well advised to either diversify their sources of strategic goods or to develop closer relations with Beijing and China's provinces (Fuchs et al., 2020, p. 16).

United States

Even though China was the first country to donate vaccines, the United States has been the biggest vaccine donor. The United States has pledged to donate at least 1.1 billion doses and has delivered 561 million doses as of July 2022 (KFF, 2022). One of the characteristics of the U.S. vaccine strategy is that it primarily donates its vaccines through COVAX, considering that the United States has donated 13% of its vaccine donations bilaterally and 87% through COVAX (KFF, 2022). The first vaccine donation delivered by the United States was on June 4, 2021, to South Korea (KFF, 2022). The destinations of the total amount of vaccine donations are rather widespread (see *Figure 2*) but when one only considers the vaccines that are donated bilaterally, it becomes quickly apparent that most vaccines are bilaterally donated to Latin America with a few outliers in Asia—Bangladesh, Pakistan, Taiwan, Thailand, South Korea, and Malaysia (see *Figure 3*).

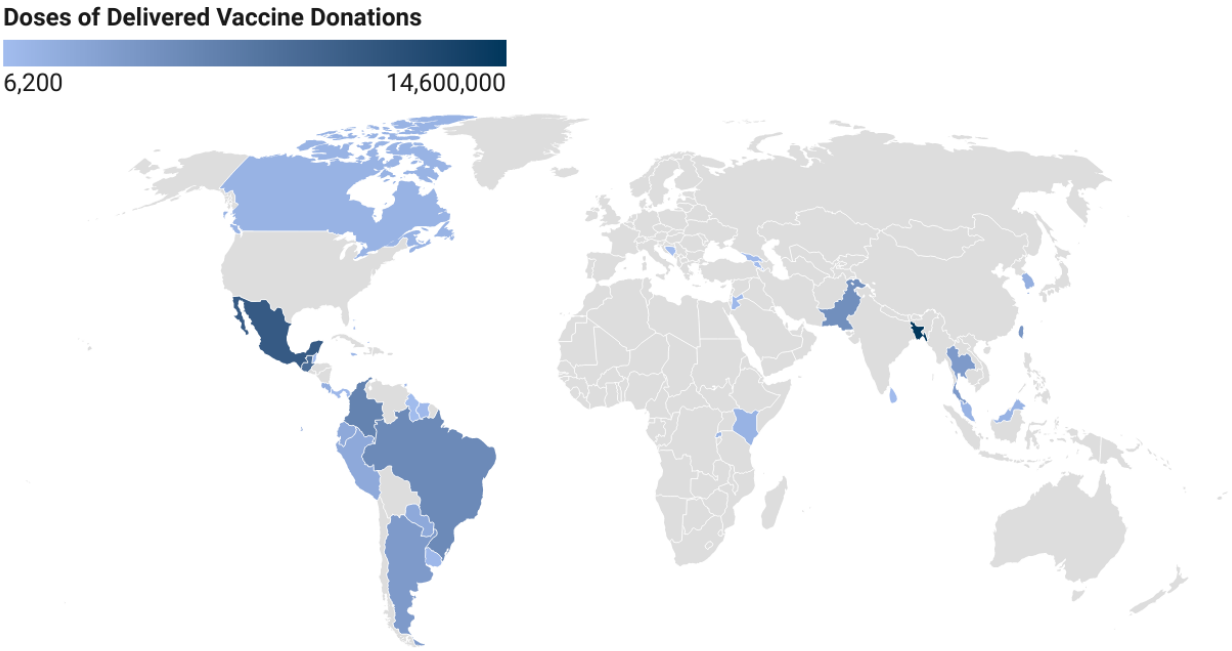
Figure 2. All Vaccine Donations by the United States



Donations as of June 4, 2022

Source: UNICEF COVID-19 Vaccine Market Dashboard • Created with Datawrapper

Figure 3. Bilateral Vaccine Donations by the United States



Donations as of June 4, 2022

Source: UNICEF COVID-19 Vaccine Market Dashboard • Created with Datawrapper

On July 1, 2021, the White House (2021a) published their *U.S. COVID-19 Global Response and Recovery Framework*. In this document, the U.S. government sets out its strategic framework to tackle the global pandemic by describing five objectives (White House, 2021a, p. 6). The most relevant objective to this thesis is *objective 1* which concerns vaccine donations. The objective is to "accelerate widespread and equitable access to and delivery of safe and effective COVID-19 vaccinations, with no strings attached" (White House, 2021a, p. 7). Particularly, the last part of this objective—'no strings attached'—is interesting to the concept of vaccine diplomacy. By explicitly stating that the United States does not want anything back for its vaccine donations, they take away the concern or argument that they do it to benefit themselves.

Before the U.S. government published this *U.S. COVID-19 Global Response and Recovery Framework*, they created a *National Strategy for the COVID-19 Response and Pandemic Preparedness* on January 21, 2021, to provide a coordinated pandemic response. Within the global pandemic response framework, the U.S. government explicitly refers to the national pandemic response, more specifically to *objective 7* of the document which states that one of the goals is to "*Restore U.S. leadership globally and build better preparedness for future threats"* (White House, 2021a, p. 3).

Interestingly, when one analyzes these documents, it becomes evident that the U.S. government explicitly engages in vaccine diplomacy. According to the U.S government itself, they provide vaccine donations with 'no strings attached', which suggests that they do not need any political favors in exchange for their vaccine donations. Therefore, they argue themselves that they do not engage in a coercive form of vaccine diplomacy. However, it does become apparent that they do engage in another form of vaccine diplomacy, namely by having the goal

of restoring global U.S. leadership. This statement could partly be considered as a subtle jab toward the former administration. President Joe Biden has criticized former President Donald Trump's foreign policy quite explicitly, and more specifically his approach towards the global COVID-19 response. On the other hand, it could also be considered as a statement against other global powers in the international system. The U.S. government signals with this statement that it wants to compete and that it wants to maintain its global hegemony, which has been challenged by China over the last few decades (Clark, 2011). It is hard to put this information into a quantifiable hypothesis, however, one could read this goal as restoring U.S. leadership over the 'free' world, considering the long U.S. history of promoting democracy and alliances with democratic countries. Furthermore, when Biden pledged the first large batch of vaccines, the White House statement explicitly states that this "donation will serve as the foundation for a coordinated effort by the world's democracies to vaccinate people around the world" (White House, 2022c). Therefore, one could expect that

(7) The United States donates more vaccines to more democratic countries.

(8) The United States donates more vaccines to countries that they politically align with.

Within this goal of restoring global U.S. leadership, the United States mentions that it unequivocally chooses for a multilateral approach (White House, 2021b, pp. 113-114). This commitment to multilateralism could be explained in different ways. Generally, there are cons and benefits connected to taking a multilateral approach. A benefit would be that multilateralism leads to a more coordinated policy and pools resources, while a negative effect for the donor would be that it loses control over its funds (Milner & Tingley, 2012, p. 2). Multilateralism leads to burden sharing when it comes to the results of foreign aid and the agents that aid is donated to are often more specialized and capable to distribute the funds (Milner & Tingley, 2012, p. 7).

Even though the United States does indeed lose control by using a multilateral approach, several scholars would argue that powerful states, like the United States, often control the policies of multilateral institutions, and that it is a way for the United States to bind themselves and convince others to cooperate, and that it is a means of getting its way through informal influence (Dreher & Jensen, 2007; Voeten, 2001; Lake, 2009; McKeown, 2009; Stone, 2011). Through this argument, one could argue that using a multilateral approach is a way of restoring U.S. leadership in the world as is described in the U.S. global vaccine strategy.

When it comes to U.S. foreign policy and foreign aid, many pillars have been consistent, even when presidents change over time. According to Morgenstern & Brown (2022), throughout the past 70 years, the three key rationales for foreign assistance have been (1) national security, (2) commercial interests, and (3) humanitarian concerns (pp. 3-4). They argue that even though providing aid for humanitarian concerns is generally more broadly supported by the American public and policymakers alike, national security and commercial interests have been the predominant theme of U.S. assistance programs (Morgenstern & Brown, 2022, pp. 3-4). It shows that U.S. foreign aid generally has had more interests over history than only humanitarian and altruistic reasons. Because commercial interests are vital to U.S. foreign aid policy, one should expect that

(9) The United States donates more vaccines to countries that they have a higher trade level with.

In 2018, the U.S. Department of State and U.S. Agency for International Development (USAID) published a *Join Strategic Goal Framework* for the period of 2018-2022. This framework was created during the Trump administration but is still in effect during the first few years of the Biden administration. The framework consists of four main goals of which goal 3 is

to promote (State-USAID, 2018, p. 23). This is noticeable because of its similarities with the *National Strategy for the COVID-19 Response and Pandemic Preparedness*. Through its foreign policy, the United States attempts to promote American leadership and values (State-USAID, 2018, p. 23). Furthermore, the joint framework also mentions its goal to increase equitable burden sharing, which could be connected to the U.S. its choice for a multilateral approach during the COVID-19 crisis (State-USAID, 2018, p. 23). These findings would suggest that the U.S. vaccine diplomacy is effectively just an extension of their foreign policy strategy.

Existing literature on the determinants of foreign aid in the case of the United States has found that foreign policy and domestic factors do not only influence disaster assistance allocations but are the overriding determinant (Drury, Olson, & Van Belle, 2005, p. 454). Drury et al. (2005) find that U.S. foreign disaster assistance, which theoretically should be nonpolitical, is far from nonpolitical and a disaster-stricken country is more likely to receive aid if they are allies to the United States (see *Hypothesis 8*) (p. 467). The democracy score of a country also has a significant effect on whether a country receives aid—more democratic countries are more likely to receive aid—but this is not as large of an effect as whether a country is an ally or not (see *Hypothesis 9*) (Drury et al., 2005, pp. 466-467). Furthermore, the GDP per capita negatively affects whether a country receives aid, which means that the United States is less inclined to give aid to countries that are more capable to help themselves (see *Hypothesis 1*) (Drury et al., 2005, p. 467).

Notably, the regressions conducted by Drury et al. (2005) include several variables that measure political affinity, domestic factors, and need, but they do not include any variables of trade or economic closeness. This is questionable considering that Morgenstern & Brown (2022) argue that commercial interests are one of the main determinants of foreign aid allocation next to

national security interests and humanitarian need (pp. 3-4). Schraeder et al. (1998) do include economic interests in their analysis and they find that trade level—next to alliance status, whether a country could be considered capitalist, and a negative relationship with GNP per capita—is of significant and positive influence on foreign aid allocated to a country (see *Hypothesis 8 & 9*) (pp. 310-311). They conclude that the United States as a foreign aid distributor could be considered as a "strategically and ideologically driven superpower that nonetheless was also influenced by economic concerns" (Schraeder et al., 1998, p. 311).

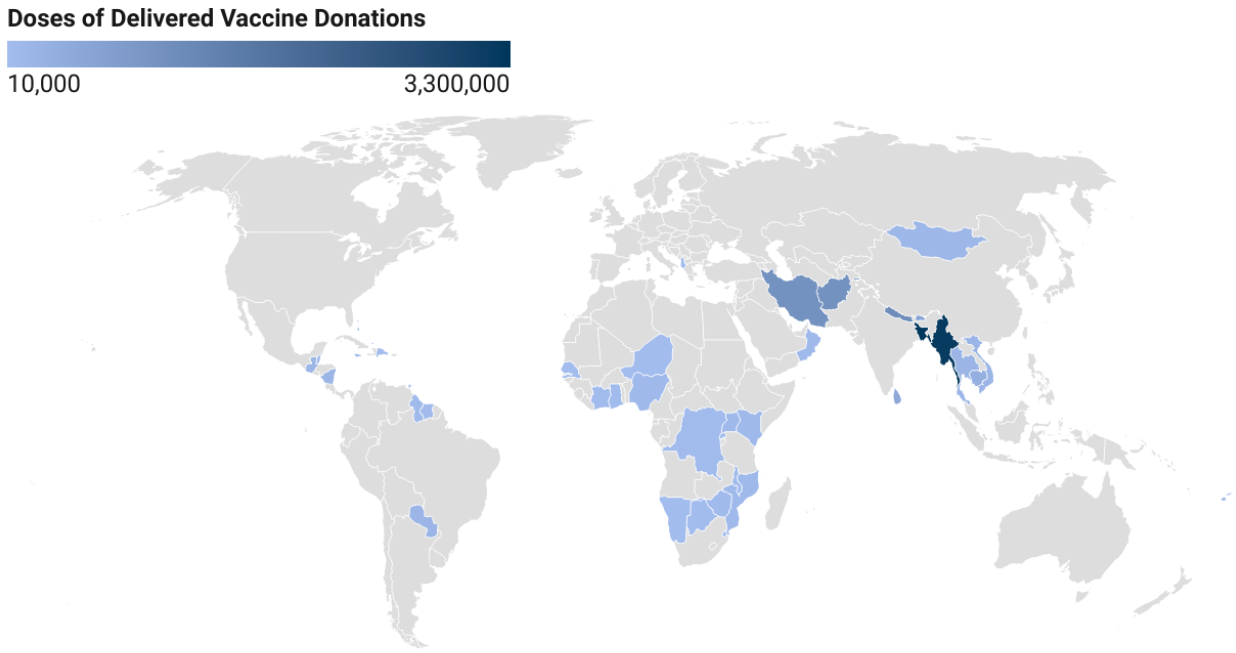
India

India also has been a big player in global vaccine diplomacy. India is seen as the 'pharmacy of the world' and used its vaccine-producing power to donate vaccines to other countries. As of July 2022, India has donated 13.7 million vaccines to other countries (UNICEF, 2022). They started to donate vaccines rather early in the pandemic—between January 20th and 22nd, they donated to Bhutan, Maldives, Bangladesh, Nepal, Myanmar, Seychelles, and Mauritius—but this was abruptly stopped because of an export ban by the Indian government in March 2021, which made it impossible for The Serum Institute of India—the largest manufacturer of vaccines in the world and the biggest supplier to COVAX—to export to countries that were set to either receive vaccines from India bilaterally or from the COVAX program (Findlay, Peel, & Mancini, 2021). India's bilateral vaccine donation program picked up again later in 2021, but it never reached the heights anymore that it had at the beginning. Only 4.1 million vaccines were donated after April 2021, which amounts to only 30% of its total bilateral vaccine donations (Ministry of External Affairs India, 2022a).

This might be one of the main reasons that India's donating numbers are significantly less than the United States and China but its strategy is rather explicit and compelling. When one

analyzes India's vaccine donations it becomes immediately clear that they primarily donated vaccines to their near neighbors (see *Figure 4*). Bangladesh and Myanmar got the most vaccines with more than 3 million doses each, Nepal, Afghanistan, and Iran also got more than a million vaccines, and Bhutan and Sri Lanka got around half a million (Ministry of External Affairs India, 2022a).

Figure 4. Bilateral Vaccine Donations by India



Donations as of June 4, 2022
Source: UNICEF COVID-19 Vaccine Market Dashboard • Created with Datawrapper

However, India does not shy away from its strategy in vaccine diplomacy. They call their program '*Vaccine Maitri*', which literally means 'Vaccine Friendship'. At the beginning of their vaccine donations program, they explicitly stated that they want to help their neighbors first and created the hashtag #NeighborhoodFirst (Ministry of External Affairs India, 2022b). They made several videos and tweets that displayed their vaccine donations (Ministry of External Affairs India, 2022b). Interestingly, Pakistan did not receive any donations, which could be explained by the tense relations between the countries (Ministry of External Affairs India, 2022a). Considering

that their vaccine diplomacy is called ‘Vaccine Friendship’ and enemies like Pakistan do not receive vaccine donations, one could hypothesize that

(10) India donates more vaccines to countries that politically align with them.

A characteristic of the Vaccine Maitri strategy of India is that the vaccine donations are always accompanied by ceremonies, tweets, and speeches. For example, India put out three videos to promote its vaccine diplomacy with speeches of leaders of the vaccine-receiving countries where they all thank India and, explicitly by name, Prime Minister Modi for their gift.

When one analyzes India’s overall foreign policy strategy, it becomes apparent that many themes come back in their vaccine diplomacy. In 2019, former ambassador of India, Achal Malhotra, gave a speech where he set out India’s most important goals in foreign policy, namely “(1) to protect India from traditional and non-traditional threats; (2) to create an external environment which is conducive for an inclusive development of India so that the benefits of growth can reach the poorest of the poor in the country; (3) to ensure that India’s voice is heard on global forums and that India is able to influence world opinion on issues of global dimensions such as terrorism, climate change, disarmament, reforms of institutions of global governance, and (4) to engage and protect Indian Diaspora” (Malhotra, 2019). Considering that Malhotra (2019) names engaging and protecting the Indian Diaspora as one of India’s foreign policy goals, a hypothesis would be that

(11) India donates more vaccines to countries that have a higher proportion of Indian diaspora in their population.

He continues to explain that India is a democracy but opposes foreign policy that aims to interfere in the internal affairs of other countries—like other democracies often do—and that

India generally wants to choose for strategic autonomy where India has partnerships but no military alliances.

Furthermore, Malhotra (2019) highlights the diplomatic outreach program that is called *India's Neighbourhood First Policy*, which puts a priority on diplomatic outreach to countries that are near to India. According to Malhotra (2019), this was necessary because India's high growth rates in economic and technological capabilities led to asymmetries in the region causing a sense of trust deficit. Malhotra (2019) is not the only one who mentions these themes, Shivshankar Menon (2020), former National Security Advisor to the Indian Prime Minister, provides a similar description. Menon (2020) argues that India should and is choosing for strategic autonomy where it "concentrates its efforts on strengthening itself, consolidating its periphery and external balancing" (p. 15). He argues that it is natural for India to give priority to the subcontinent because by consolidating the periphery and ensuring that it cannot be used against its interest, India will increase its national security and have more opportunity to develop (Menon, 2020, p. 15). He mentions past attempts of China and the United States to gain footing in the South Asian subcontinent and argues, just like Malhotra (2019), that India has attempted to stop this from happening (Menon, 2020, p. 15). Considering that India's 'Neighborhood First Policy', it would be reasonable to suggest that

(12) India donates more vaccines to countries that are geographically close to them.

Additionally, both Malhotra (2019) and Menon (2020) discuss India's troubled relationships with Pakistan and China, and how these relationships are of significant influence on India's foreign policy. For example, India does not endorse China's Belt and Road Initiative, particularly the China-Pakistan Economic Corridor (CPEC) (Malhotra, 2019). Because of the

tense relationship with China, one could hypothesize that India would want to counter China's foreign policy goals and befriend countries that recognize Taiwan, therefore,

(13) India donates more vaccines to countries that recognize Taiwan

Existing literature on the foreign aid allocation of India notes that it is interesting that India is emerging as a donor country, even though the country still experiences significant poverty itself (Fuchs & Vadlamannati, 2012, p. 1; Sridharan & Jain, 2018). According to the empirical research of Fuchs & Vadlamannari (2012), India could be described as a 'needy' donor, and commercial and political self-interests dominate their aid allocation, more than all other major donors (p. 1). Countries that align more with India on voting in the UN General Assembly (see *Hypothesis* 10) and receive more Indian exports are more likely to get more Indian foreign aid (Fuchs & Vadlamannari, 2012, pp. 17-18). This finding of India being a 'needy donor' would suggest that

(14) India donates more vaccines to countries that they have a higher trade level with.

They also find that countries that are geographically closer (see *Hypothesis 12*) and are at a similar developmental stage as India are more likely to receive foreign aid from India (Fuchs & Vadlamannari, 2012, p. 1). Sridharan & Jain (2018) come to similar conclusions as Fuchs & Vadlamannari (2012) considering that they find that Indian development cooperation is "largely politically and security-motivated" (p. 55) but they do note that it is primarily to "cultivate goodwill toward India and long-term relationships rather than immediate payoffs" (p. 85).

Quantitative Analysis

The quantitative analysis is conducted through performing several OLS regression models with different variables. The vaccines donated to another country are used as dependent variable. This thesis will elaborate on the variables that will be used in the regressions. Separate

regressions will be run of the different donor countries to see what the different preferences are between the countries. From the regressions, certain countries were omitted because of a lack of data—Eritrea, North Korea, Monaco, Liechtenstein, San Marino, Turkmenistan, Vatican City, and Taiwan. Also, China, the United States, and India were omitted as recipient countries because they were already considered as donors in this regression and did not donate to each other.

Variables

This thesis uses a variety of variables to attempt to explain what the determinant variables for the donation of vaccines during the COVID-19 pandemic are for China, the United States, and India. To accomplish this, it uses donations per capita as dependent variable. For the independent variables, it distinguishes between two types of variables, namely variables that are based on political motivations and variables that are based on need. The general regression that will be run for the different countries can be expressed in the following formula:

$$\textit{Log of Vaccine Donations per capita (+1)}_i = \beta_0 + \beta_1 * \textit{General Political Variables}_i + \beta_2 * \textit{Need Variables}_i + \beta_3 * \textit{Country-Specific Political Variables}_i + \varepsilon_i$$

Vaccine Donations

During the COVID-19 pandemic, many countries that are generally more wealthy have donated vaccines to countries that need vaccines. There were different ways of providing vaccines to other countries, for example, through donations or through selling vaccines commercially, and it could be done bilaterally or multilaterally, for example, through COVAX. This thesis explicitly chooses to focus on donations that are provided bilaterally. The reasoning for this is that with donations, it would be expected that nothing would be asked in return, while commercial vaccines will come with a trade in money. Furthermore, in bilateral donations, a

donor country can specifically choose who they would donate vaccines to and it will be more prominent that the vaccines came from that country. One of the characteristics of multilateralism is that a country to a large extent loses control over its donations (Milner & Tingley, 2012, p. 2). By ignoring COVAX in the analysis, only the narrative of the United States would be affected. China and India did not donate any vaccines to COVAX—only sold vaccines—while the United States donated 87% of its vaccine donations through COVAX (UNICEF, 2022; KFF, 2022). Yet, because of its proneness to political influence, it would still be compelling to only regard the bilateral vaccine donations of the United States.

For the data collection of the vaccine donations, this thesis used several strategies. Overall, the dataset of UNICEF (2022) was used because it seems the most reliable, authoritative, and consistent source. This thesis only incorporates the actual deliveries of bilateral vaccine donations, so not those that are pledged but not delivered yet. In this way, it is possible to have the data of all the incorporated donor countries, China, the United States, and India, all in one dataset. The negative part of this dataset is that it does not include timestamps of the vaccine donations in its dataset, which makes it impossible to take certain periods separately in an analysis. To check the reliability of the UNICEF (2022) dataset, this thesis has checked with other country-specific datasets whether the numbers match. For China it used the dataset of Bridge Consulting (2022), for the United States it used the dataset of the Kaiser Family Foundation (2022), and for India, it used the data from the website of the Ministry of External Affairs of India (2022a). The time frame of the dataset is all donations from the beginning of the pandemic until June 23, 2022.

For the dependent variable, the logarithm of donations per capita (+1) was used. This is consistent with the literature and is done to keep the effect of population constant and avoid the

problem of having too many zeros in our dependent variable (Aklin & Kern, 2019, p. 19). This data is still relevant because it is also interesting when a country does not receive any donations but by adding 1 donation to the overall donations and then dividing it by the population size and taking the logarithm, a more sound regression can be conducted, while altering the data a neglectable amount. By taking the donations per capita, one already assumes that population has a significant effect on how many vaccines a country would donate to another country. This assumption seems reasonable and reoccurs in the literature quite often, but, admittedly, it does assume that a donor country considers need created by the size of a population and it could be that a country does not consider that in one's donation. Therefore, this paper will conduct a robustness check with a different dependent variable to make sure that the findings are robust. It takes the logarithm of donations (+1) with the logarithm of population size as a control variable to see whether the same results are found when donations are not considered per capita.

United Nations General Assembly Voting Alignment

When it comes to the independent variables, several variables were collected to understand political reasons for donating vaccines or reasons based on need of the recipient country. The most salient variable for political alliance is whether countries vote similarly within the United Nations General Assembly (UNGA) and is widely used in the existing literature as a proxy for bilateral political relations (Fuchs & Vadlamannati, 2012, p. 14; Zhao, Kennedy, & Tang, 2018; Fuchs et al., 2020, p. 8; Telias & Urdinez, 2022, p. 125). It is a powerful variable considering that various empirical studies have found that "developing countries get more aid and better conditions from donors when they have closer political ties with the donor, as measured by their UNGA voting alignment" (Dreher & Fuchs, 2015, p. 1002)

For this variable, the dataset of Bailey, Strezhney, & Voeten (2016) is used. It uses the average agreement scores between countries in the United Nations General Assembly over a period of 1991 (post-Cold War) and 2019 (pre-pandemic). The variable is on a scale from 0 to 1 with a mean of 0.66, a minimum score of 0.19, and a maximum score of 0.94 (see *Table 6*). When one analyzes the variable, it becomes apparent that China and India have relatively high average scores (0.82 and 0.77), while the United States has a rather low average score (0.38) (see *Tables 7-9*)

Trade Level

The level of bilateral trade two countries have has been rather relevant in determining the allocation of foreign aid, according to the existing literature (Schraeder et al, 1998). The trade level between countries can be a proxy for how intertwined the economies of the donor and recipient countries are and how important it is for the donor country that the economy of the recipient country keeps running. Multiple papers and this thesis have defined trade level as the flow of export to a recipient, as a percentage of the recipient's overall imports in 2013-2018, using data from UN Comtrade and ITC (2022) (Schraeder et al., 1998, p. 303; Zhao, Kennedy, & Tang, 2018, p. 4). The variable runs from 0 (no trade between countries) to 1 (all imports are from the exporting country) (see *Table 6*).

Democracy

According to the literature, whether a country is democratic and has a similar regime type could influence foreign aid allocation (Drury et al., 2015, pp. 457-458; Telias & Urdinez, 2022, p. 125). This thesis uses the metric of the Freedom House (2020) that indicates how democratic and free a country is on a scale of 100 and is divided into 40 points for political rights—electoral

process, political pluralism and participation, and functioning of government—and 60 points for civil liberties—freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy and individual rights. The score is divided by 100 to make it a scale from 0 to 1. The Freedom House (2020) score of 2020 was used that covers developments in 195 countries from January 1, 2019, through December 31, 2019. Whether to use the Freedom House (2020) score or other measures like Polity V or V Dem is a debate within the literature, but this thesis chose the Freedom House (2020) score because the other measures missed a few relevant countries that do receive donations and should be included in the analysis.

Distance

For the analysis, it is important to include certain gravity control variables. It became apparent in the descriptive case studies that distance might be an important factor in determining what countries to donate vaccines to. For example, in the case of India, the Indian government explicitly chooses for a 'Neighborhood First Policy' (Malhotra, 2019). This variable is widely used in the literature as either a gravity control variable or a political variable (Dreher & Fuchs, 2015, p. 1002; Fuchs et al., 2020, p. 29; Fuchs & Vadlamannati, 2012, pp. 13-14). Reasons for donating to countries that are closer could be practical, for example, it is easier, quicker, and cheaper to transport vaccines to countries that are less far away (Fuchs et al., 2020, p. 29; Fuchs & Vadlamannati, 2012, p. 14). It could also be because of geopolitical reasons, for example, because a country wants to create a geopolitical space where the donating country is a regional hegemon. The data used for distance is extracted from CEPII's GeoDist Database (Mayer & Zignago, 2011). The distance variable contains of the logarithm of the distances between the capital cities of the donating countries (Beijing, Washington D.C., and New Delhi) and the receiving countries in kilometers.

GDP per capita

As a variable to indicate need, this thesis uses the variable of GDP per capita to measure the wealth a country has, which could also be considered as the resources that countries have to buy vaccines. Especially wealthier nations had the capabilities to invest early in vaccines and thus had more vaccines when they were developed (Tatar et al., 2021). The data on GDP per capita was taken as an average from 2013 (post-financial crisis) to 2018 (pre-pandemic) and was retrieved from the World Development Indicators Database of the World Bank (2022).

COVID-19 Data

Next to need based on available resources, it is also important to assess how severe the COVID-19 crisis is in a country. It would be expected that the countries that are suffering the most due to the pandemic would also receive the most vaccine donations. This thesis uses the dataset collected from official reports by the *Our World in Data* team (Mathieu, Ritchie, Ortiz-Ospina, Roser, Hasell, Appel, Giattino, Rodés-Guirao, 2021). It uses a variable indicating the total deaths attributed to COVID-19 per 1,000,000 people (Mathieu et al., 2021) and one indicating the total number of people who received at least one vaccine dose per 100 people in the total population (Johns Hopkins Coronavirus Resource Center, 2022). The data that is extracted from the dataset is reported on March 25, 2021, which is the day that India enacted its vaccine export ban (Findlay et al., 2021). This date is taken because it occurred relatively soon after vaccine diplomacy started, most vaccine donations happened after this date, and it was a period when the demand for vaccines was rather high, while supply was low (Findlay et al., 2021).

Taiwan & Belt and Road Initiative

Next to general political variables and need variables, this thesis also considers a few country-specific political variables to better explain the political economy of vaccine donations. For China, two country-specific variables are added. First, the variable of whether a country recognizes Taiwan or not is included in the regression of China and India. The 'One China Policy' is essential in China's foreign policy approach and considering that India regards itself as an adversary of China it would be interesting to see whether this also plays a role in their decision-making to bring non-China allies closer to them. A dummy variable is created with 1 being an ally with Taiwan and 0 not being an ally with Taiwan. The diplomatic allies are taken from the website of Taiwan's Ministry of Foreign Affairs (MOFA, 2022). These are just 14 countries—Belize, Guatemala, Haiti, Honduras, Paraguay, St. Kitts & Nevis, St. Lucia, St, Vincent & the Grenadines, Eswatini, Marshall Islands, Nauru, Palau, Tuvalu, and Vatican City (MOFA, 2022).

The Belt and Road Initiative (BRI) also is a vital part of China's foreign policy strategy. The BRI variable is a dummy variable of countries that have joined the BRI by signing a Memorandum of Understanding (MoU) with China (1) and those who do not have such an MoU (0). 147 countries have signed such an MoU, according to the Chinese government, as of March 2022 (Nedopil, 2022). The numbers from 2022 are used because the countries that joined the BRI between 2020 and 2022—approximately 9 countries—were most probably already on the radar of China during the pandemic. An interesting example is the Democratic Republic of the Congo that signed an MoU with China for the BRI in January 2021 and received vaccine donations in September 2021 (Belt and Road Portal, 2021; UNICEF, 2021). Furthermore, "some countries that are listed as having signed an MoU for the BRI, the availability of independent

information is contradictory, for example, the seven countries of Austria, Benin, Comoros, the Republic of the Congo, Dominica, Niger, and Russia have not published a confirmation of signing a full MoU or even denied it" (Nedopil, 2022). These seven countries are unclear but are still considered as a 1 in the data because apparently the Chinese government does consider them as BRI countries and excluding them from the data would mean that a few rather relevant countries would be excluded from the whole regression.

Indian Diaspora

Within the analysis of India's foreign policy, it becomes apparent that Indian diaspora engagement is rather important (Malhotra, 2019). As a country-specific political variable, the logarithm of Indian diaspora per capita is used to provide an idea of whether it is important for the Indian government in their vaccine donations whether there is a significant Indian diaspora present in a country. The information is taken from the Ministry of External Affairs India (2022c) because their perception of how much Indian diaspora is present in a country should be based on these numbers. The Indian government categorizes 'Overseas Indians' between Non-Resident Indians (NRIs)—who are Indian citizens who live in a different country—and Persons of Indian Origin (PIOs)—who are people who used to be Indian or have parents from India (Ministry of External Affairs India, 2022c). This thesis uses the logarithm of all 'Overseas Indians' per capita because it provides a good picture of how important this country might be in India's effort of Indian diaspora engagement.

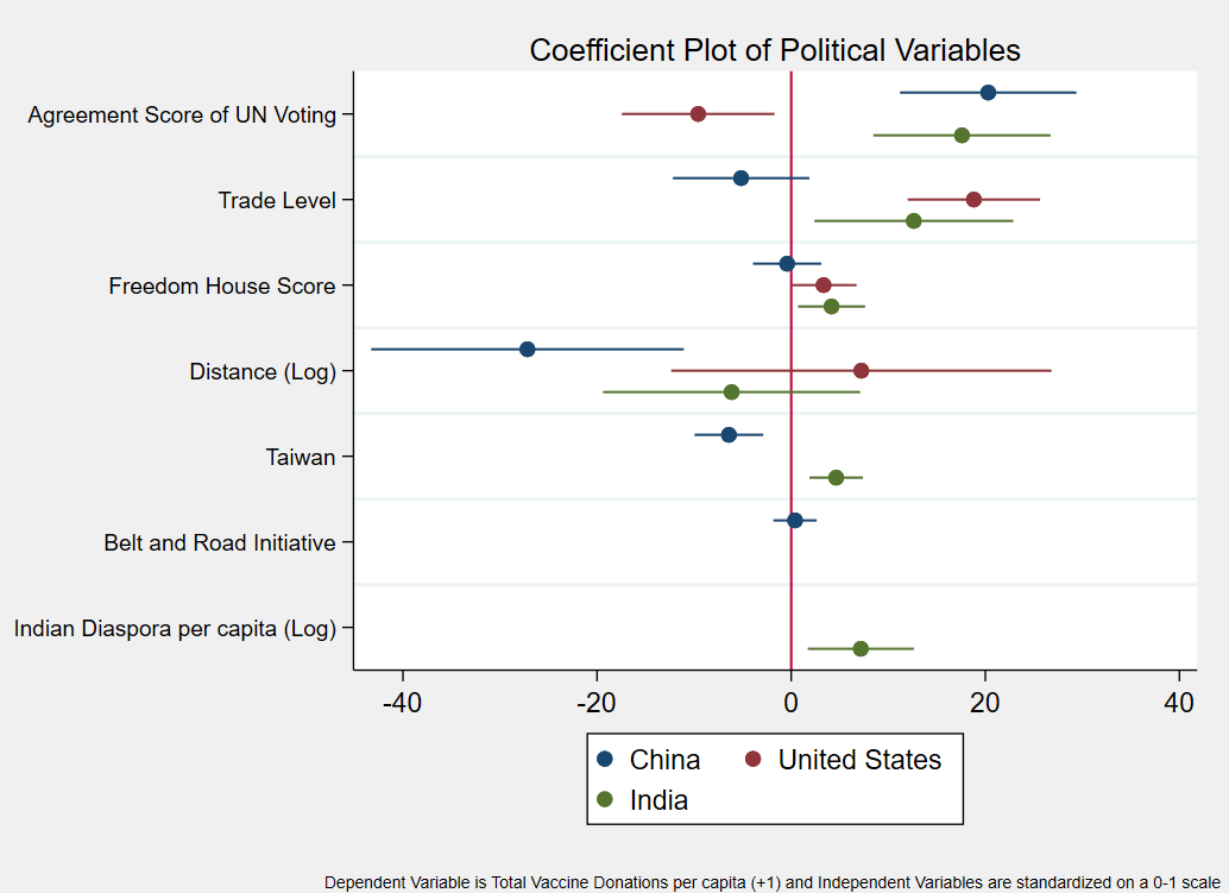
Results

Table 1. Random Intercept Model of the effect of Political and Need variables on the log of Total Vaccine Donations (+1) and per capita (+1)

	Log of Vaccine Donations per capita (+1)			Log of Total Vaccine Donations (+1)		
	(1)	(2)	(3)	(4)	(5)	(6)
	China	United States	India	China	United States	India
UN Voting	17.65***	-9.107*	15.36**	20.30***	-10.58*	17.60***
	(5.110)	(4.167)	(4.914)	(4.602)	(4.082)	(4.627)
Trade Level	-8.422*	19.91***	10.29	-5.156	17.68***	12.63*
	(3.934)	(3.608)	(5.513)	(3.564)	(3.607)	(5.187)
Democracy	3.164	5.626**	5.910**	-0.419	3.562*	4.163*
	(1.889)	(1.707)	(1.829)	(1.780)	(1.731)	(1.750)
Distance	-2.209*	0.832	-0.269	-2.753**	0.692	-0.622
	(0.917)	(1.052)	(0.722)	(0.827)	(1.006)	(0.680)
GDP per capita	-1.868***	0.0901	-0.673	-2.114***	0.0595	-0.517
	(0.401)	(0.354)	(0.393)	(0.361)	(0.341)	(0.370)
Deaths	-0.00111	0.000830	-0.00108	0.000459	0.00167*	-0.000405
	(0.000742)	(0.000687)	(0.000662)	(0.000707)	(0.000684)	(0.000635)
Vaccinations	-0.0185	-0.0474	0.0124	-0.0158	-0.0369	0.0175
	(0.0349)	(0.0314)	(0.0304)	(0.0313)	(0.0303)	(0.0285)
Taiwan	-1.968		6.706***	-6.420***		4.637**
	(1.847)		(1.427)	(1.791)		(1.400)
BRI	2.218			0.398		
	(1.224)			(1.132)		
Indian Diaspora			0.569***			0.365*
			(0.144)			(0.141)
Population				-0.378	0.295	0.0338
				(0.210)	(0.197)	(0.193)
Constant	10.92	-22.99*	-16.05*	39.90***	-9.031	-1.727
	(9.298)	(10.26)	(7.804)	(9.440)	(10.46)	(7.855)
Adjusted R^2	0.3698	0.3252	0.3439	0.4906	0.2921	0.2702
Observations	183	183	183	183	183	183

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 5. Coefficient Plot of Political Variables with Log of Vaccine Donations (+1) as dependent variable



China

The data fits the first model with regards to the logarithm of donations per capita (+1) of China well and is significant overall (F (9, 173)=13.23, p<0.001, R^2=0.40). When one analyzes the outcome of China's regression, a few independent variables are noticeable. It becomes apparent that UN Voting alignment has a strong significant and positive effect on the number of vaccines a country will get per capita (b=17.65, SE=5.11, p=.001). This means that when a country is more often aligned with the Chinese government in the UN General Assembly voting, they were more likely to receive a higher amount of vaccine donations per capita from China. Also trade level (b=-8.42, SE=3.93, p=.034) and the logarithm of distance (b=-2.01, SE=.92,

p=.017) are significant, but negative. This means that the lower the trade level of a country was with China prior to the pandemic and the further away a country is, the more vaccine donations per capita they could expect. Next to these explanatory variables for political purposes, the logarithm of GDP per capita, which is regarded as a variable of need, is significant and negative (*b*=-1.87, *SE*=0.40, *p*>.001). In other words, when a country has a lower GDP per capita, i.e. is poorer, they were more likely to receive a higher amount of vaccine donations per capita from China.

When one analyzes the data and regressions of China, it becomes quickly evident that a few outliers in the data heavily influence an important political variable, namely the Taiwan variable. China has not donated any vaccines to countries that recognize Taiwan, but because this thesis uses the log of vaccine donations per capita (+1) it could seem that some countries with a rather low population size seem to have gotten more vaccine donations. This is proven by excluding the countries with less than 200,000 people in *Table 11* (*F* (9, 157)=14.25, *p*<0.001, R^2=0.45). Here the Taiwan variable is indeed significant and negative, which makes sense considering no country that recognizes Taiwan got any vaccine donations from China (*b*=-6.10, *SE*=2.46, *p*=.014).

Whether a country is part of the Belt and Road Initiative is not significant in the first model (*b*=2.22, *SE*=1.22, *p*=.072). However, because no country that recognizes Taiwan is part of the Belt and Road Initiative, the regression was also attempted once with the variable of the recognition of Taiwan removed (*F* (8, 174)=14.32, *p*<0.001, R^2=0.40) (*Table 14*). In this model, UN Voting Alignment (*p*>.001), trade (*p*=.037), distance (*p*=.087), and GDP per capita (*p*>.001) are still significant, while others are still insignificant except for the variable that indicates whether a country is part of the Belt and Road Initiative (*b*=2.87, *SE*=1.06, *p*=.007). In other

words, when one does not consider the variable of the recognition of Taiwan because these are all not part of the Belt and Road Initiative, it becomes apparent that participants of the Belt and Road Initiative received more vaccine donations per capita than if they were not.

When one does not consider the logarithm of the donations per capita (+1) but only the logarithm of the donations (+1), the data would still fit the model and is significant (F (10, 172)=18.53, p<0.001, R^2=0.49). Similarly to the first model, UN Voting Alignment (b=20.30, SE=4.60, p>.001), the logarithm of distance (b=-2.75, SE=.83, p=.001), and the logarithm of GDP per capita (b=-2.11, SE=.36, p>.001) are all still significant. Trade was already barely significant in the first model and in this model it is not significant anymore (b=-5.16, SE=3.56, p=.150). As expected, the Taiwan variable is highly significant when one does not consider the donations per capita (b=-6.42, SE=1.79, p>.001). Similarly to the first model, when one builds a model without the Taiwan variable (F (9, 172)=17.93, p<0.001, R^2=0.48), whether a country is part of the Belt and Road Initiative is significant and positive (b=2.60, SE=.98, p=.009).

United States

The data fits the second model with regards to the logarithm of donations per capita (+1) of the United States well and is significant overall (F (7, 175)=13.53, p<0.001, R^2=0.35). When one analyzes the outcome of regression of the United States, a few independent are noticeable. It becomes apparent that UN Voting alignment has a significant and negative effect on the amount of vaccines a country will get per capita (b=-9.11, SE=4.17, p=.030). This means that when a country is more often aligned with the U.S. government in the UN General Assembly voting, they were more likely to receive a lower amount of vaccine donations per capita from the United States. Also, the trade level with the United States is highly significant and strongly positive (b=19.91, SE=3.61, p>.001). This means that when a country had a higher volume of trade

before the COVID-19 pandemic, a country would receive a higher amount of vaccine donations per capita from the United States during the pandemic. Whether a country is more democratic, according to their Freedom House Score, has a positive and significant effect on the amount of vaccine donations per capita a country receives from the United States (b=5.63, SE=1.71, p=.001). In other words, the more free and democratic a country is, the more vaccines a country receives per capita.

When one does not consider the logarithm of the donations per capita (+1) but only the logarithm of the donations (+1), the data would still fit the model and is significant (F (8, 174)=10.35, p<0.001, R^2=0.32). Similarly to the first model, UN Voting Alignment (b=-9.58, SE=3.98, p=.017), trade level (b=18.82, SE=3.46, p>.001), the Freedom House Score(b=3.34, SE=1.72, p=.041) are all still significant. However, when the total amount of vaccine donations is considered and not per capita, the total deaths per million are also significant and positive (b=.0016, SE=.0007, p=.018).

India

The data fits the first model with regards to the logarithm of donations per capita (+1) of India well and is significant overall (F (9, 173)=11.60, p<0.001, R^2=0.38). When one analyzes the outcome of India's regression, a few independent variables are noticeable. It becomes apparent that UN Voting alignment has a strong significant and positive effect on the amount of vaccines a country will get per capita (b=15.36, SE=4.91, p=.002). This means that when a country is more often aligned with the Indian government in the UN General Assembly voting, they were more likely to receive a higher amount of vaccine donations per capita from India. Whether a country is more democratic, according to their Freedom House Score, has a positive and significant effect on the amount of vaccine donations per capita a country receives from

India (*b*=5.91, *SE*=1.83, *p*=.001). Furthermore, the independent variable of whether a country recognizes Taiwan is significant and positive (*b*=6.71, *SE*=1.43, *p*>.001) and the logarithm of the Indian Diaspora that is present in a country is significant and positive (*b*=.57, *SE*=.14, *p*>.001).

When one does not consider the logarithm of the donations per capita (+1) but only the logarithm of the donations (+1), the data would still fit the model and is significant (*F* (10, 172)=7.74, *p*<0.001, R^2=0.31). Similarly to the first model, UN Voting Alignment (*b*=17.60, *SE*=4.63, *p*>.001), the Freedom House Score (*b*=4.16, *SE*=1.75, *p*=.018), Taiwan (*b*=4.64, *SE*=1.40, *p*=.001), and the logarithm of Indian Diaspora per capita (*b*=.36, *SE*=.14, *p*=.010) are all still significant. However, when the total amount of vaccine donations is considered and not per capita, trade level is also significant and positive (*b*=12.63, *SE*=5.19, *p*=.016).

Discussion

China

In the quantitative analysis, it becomes swiftly clear that need is not the most important determinant for how many vaccines a country receives. Only GDP per capita is significant and negative for China in both analyses. That China generally donates vaccines to poorer countries aligns with the first hypothesis and with their foreign policy that explicitly states that it mainly focuses on developing countries (Kobierecka, 2022, p. 5). This thesis used GDP per capita as a measure of need—as most of the literature does. However, what the real strategic reasons are for China to focus on developing countries could be questioned and would not further research behind this overall goal of China's foreign policy. Even though it could come from purely need-based intentions, one could also argue that this is a way to have more countries on their side when it comes to geopolitics and its battle for global hegemony with the United States because it would be more effective to extract favors from developing countries considering their lack of

resources. What the intentions are for China to focus on developing countries epistemologically exceeds the scope of this thesis, but it can observe that donating vaccines to poorer countries both aligns with the idea of humanitarian foreign aid and with China's overall foreign policy strategy.

Next to this variable of need, it becomes rather evident that for China mainly political variables seem to be the determining factors of vaccine donation allocation. Whether a country politically aligns with China is significant and positive, which means that China donates more vaccines to countries that politically align with them (*Hypothesis 3*). This confirms this thesis' qualitative analysis, which found that China primarily extracted favors from countries that had a higher political alignment, and results and theories from existing literature (Dreher & Fuchs, 2015, pp. 1018-1019; Telias & Urdinez, 2022, p. 126; Fuchs et al., 2020, p. 24). Whether a country recognizes Taiwan was not statistically significant in the first analysis, but it became evident that this was mainly because of a bias in the data because of the small population size of a few islands in the Asia-Pacific region that recognize Taiwan—Marshall Islands, Nauru, Palau, and Tuvalu (MOFA, 2022). When the outliers with the smallest population size were not considered and donations were considered in total and not per capita, it became clear that countries that recognize Taiwan receive fewer vaccines from China (*Hypothesis 4*). As a matter of fact, no country that recognizes Taiwan received any vaccine donations nor commercial sales from China (Bridge Beijing, 2022). This result aligns with the existing literature and smoothly fits within China's foreign policy philosophy concerning its sovereignty (Dreher & Fuchs, 2015; Telias & Urdinez, 2022; Fuchs et al., 2020). Whether a country is part of the Belt and Road Initiative (*Hypothesis 5*) initially did not come out significant, which was rather surprising. However, considering that all countries that recognize Taiwan are also not part of the BRI, a few

regressions were attempted that omitted the variable of Taiwan because the Taiwan variable would heavily influence the significance of the BRI variable. And indeed, the hypothesis that countries that are part of the BRI receive more vaccines from China was confirmed.

This thesis had not hypothesized anything regarding the geographical distance of a country to China because it does not clearly come forward in their foreign policy strategy. Yet, it appeared to be that the closer a country is, the more vaccines it got. One could theorize this in purely practical terms because it is easier to ship vaccines to these countries or one could argue that it is a way for China to claim its geopolitical space. Considering that existing literature also does not explain this phenomenon, this thesis is inconclusive with regard to distance and China. Furthermore, trade level was surprisingly only significant in the first model and was even negative. This refutes hypothesis 2 that China would donate more vaccines to countries that they have a high trade level with. It is a bit puzzling what the explanation for this phenomenon is considering that it also counters the existing literature on bilateral foreign aid of China. One explanation could be that China uses the pandemic as a way to create new economic bonds. Further research would be interesting to examine this finding.

United States

For the United States, it also appears that variables of need are not the only factors in how many vaccines a country gets per capita. The only variable of need is COVID-19 deaths, which is slightly significant in the robustness check but not in the initial analysis. It could be that the severity of the pandemic plays a role in the bilateral distribution of vaccines for the United States, but because it only appears significant in the robustness check, this thesis is inconclusive with regards to this finding. Yet, the trade level with the US seems to be a rather important factor, meaning that if a country already had a higher pre-existing trade relation with the United

States, they were more likely to receive more vaccine donations per capita (*Hypothesis 9*). This generally does make sense, as analyzed earlier because the United States has donated most of its bilateral vaccine donations to Latin America and certain Asian countries. Latin American countries have a much higher average trade level with the United States (*M*=.34) than the whole world has (*M*=.10). But also within Latin America there is variance considering that the countries that received vaccines from the United States had a higher average trade level (*M*=.36) than the overall average of Latin America (*M*=.34). This difference is primarily present because Cuba and Bolivia, who have low trade levels with the United States, did not receive any bilateral vaccine donations from the United States. It is harder to explain for the Asian countries, considering that those five countries—excluding Taiwan because of a lack of data—have the same average trade level as the rest of the region (*M*=.06). According to Morgenstern & Brown (2022), commercial interests are a cornerstone of foreign aid allocation and is often used as a tool to keep trade running (p. 4). An example from history of this would be the Marshall Plan (1948-1951) where the United States helped to rebuild Europe, partly to "reestablish the capacity of European countries to trade with the United States" (Morgenstern & Brown, 2022, p. 4). The COVID-19 pandemic is a crisis that disturbed many economies and by donating vaccines to countries that have a high trade level with the United States, these economies would be disturbed less hard and for a shorter period. It is epistemologically hard to know the intentions of the U.S. government for certain, but after analyzing the American overall foreign policy strategy and the empirical findings of this study, it is reasonable to state that trade level might have been a significant determinant of how many vaccines the United States donated to a country.

A similar analysis can be conducted for the political alignment with the United States. According to the regression, the less politically a country is with the US, the more vaccine

donations they could expect. This does not align with *hypothesis 8* but can be rationalized based on the data. Overall, the average UN voting alignment is already rather low globally (*M*=.38). However, in Latin America, this average is even lower (*M*=.34). Countries with rather high average agreement scores—Israel, United Kingdom, Canada, France, Australia—have generally not needed vaccine donations because they are generally wealthier and had enough access themselves. Therefore, it does not seem too odd that this variable is negative. Also, the Asian countries that received vaccine donations have a lower average agreement score (*M*=.34) than the rest of the region (*M*=.38).

Whether a country is free and democratic also seems to be an important positive determinant in a country getting vaccine donations from the United States. Overall, the average Freedom House Score of the entire world, excluding the United States, is 58.7, while in Latin America it is 71.7. However, solely pointing at the region that the United States has donated to is not enough, considering that the average Freedom House Score of the countries that the United States has donated vaccines to is much higher than Latin America overall (*M*=80.6). The finding that the more free and democratic a country is, the more vaccine donations they could expect from the United States, also is an expression of foreign policy strategy. The United States is known for promoting democracy across the world and other studies have already found that this is central in their foreign aid allocation (Drury et al., 2005, pp. 466-467). One of the main goals of the COVID-19 response framework was to "restore U.S. leadership globally and build better preparedness for future threats" (White House, 2021a, p. 3). The Biden administration, even though it explicitly stated that their vaccine donations were no strings attached, clearly had the goal of restoring U.S. global leadership of the free world, which they argued was lost during the Trump administration.

Not only the determinants of bilateral vaccine donations largely overlap with the overall U.S. strategy. How the United States distributed most vaccines is already an expression of foreign policy strategy. The U.S. government explicitly chose for a multilateral approach within its *U.S. COVID-19 Global Response and Recovery Framework* and its overall foreign policy strategy that was made well before the COVID-19 pandemic (White House, 2021b, pp. 113-114); State-USAID, 2018, p. 23). Taking a multilateral approach is on one hand a strategy for the United States to increase burden sharing between wealthier countries, while on the other hand, it is a way for the United States to portray its global and multilateral leadership by taking the lead in COVAX, which is a global effort, but is primarily led and supported by democratic and wealthier countries (Milner & Tingley, 2012, p. 7; UNICEF, 2022).

India

The empirical results for India are a bit more puzzling than that of China and the United States considering that it does not completely align with the literature. Within the case study analysis, it became evident that the 'Neighborhood First Policy' is an essential part of India's foreign policy strategy (Malhotra, 2019). However, distance does not seem to be significant in the quantitative analysis, which refutes *hypothesis 12*. When one looks at the data of India's donations a bit more deeply, a few things become apparent that might explain this phenomenon. Of the 47 countries that India has donated to, the vast majority, namely 32 countries, come from Sub-Saharan Africa or Latin America. Yet, these regions get on average in absolute donations way less (M=67,031) than the average of all countries (M=291,851). When one only considers a radius of 3,000 kilometers from New Delhi, so only India's neighborhood, the mean of total donations is even higher (M=1,106,200). So, even though the logarithm of distance is not significant in the quantitative analysis—most probably because the vast majority of countries

that India has donated to are far away and have a lower population size—it does seem that the neighborhood of India gets more vaccines when one only considers the countries that received vaccines and when the total amount of vaccine donations (log of vaccine donations (+1)) is considered instead of vaccine donations per capita. This thesis proves this by running a regression with only the countries that received vaccines from India and considers the total vaccine donations instead of the vaccine donations per capita and it is interesting to see that only the logarithm of distance is negative and significant (b=-.95, SE=.28, p=.002) and the logarithm of population size is positive and significant (b=.31, SE=.13, p=.024). This proves that when the total amount of vaccine donations and only the countries that received vaccine donations are considered that the closer a country is and the more citizens they have, the more vaccines they get if they receive vaccine donations from India.

So, countries in the region clearly get more vaccine donations on average when they receive vaccine donations, but this apparently does not explain the vaccine donations. So the 'Neighborhood First Policy' of India is clearly present in their vaccine diplomacy strategy but there are other factors that better explain India's vaccine diplomacy. Fuchs & Vadlamannari (2012) described India as a 'needy' donor that cares a lot about political and commercial self-interests (pp. 17-18). The findings do indeed suggest that a higher political alignment led to more vaccine donations, but trade did not have a significant effect on the vaccine donations in the first model. Trade was significant, however, when the total amount of vaccine donations was considered and not per capita. That trade is not significant is a bit puzzling but it could maybe be explained by India's vaccine diplomacy strategy in Latin America and Sub-Saharan Africa. As noted before, the vast majority of India's recipient countries are in Latin America and Sub-Saharan Africa, and the trade level of these recipient countries is on average lower (M=.042)

than the overall average of recipient countries (*M*=.074). This does not seem to be odd considering that it is quicker, and cheaper to transport vaccines to countries that are less far away (Fuchs et al., 2020, p. 29; Fuchs & Vadlamannati, 2012, p. 14). These Latin American and Sub-Saharan countries have most probably made trade less significant—just like it did with distance—while their UN Voting Agreement Score is higher (*M*=.833) than that of the overall recipient countries (*M*=.827).

Another factor in the determinants of vaccine diplomacy of India is democracy score. India is more likely to donate vaccines to more free and democratic countries. This is both explainable and noticeable at the same time. India is one of the largest democracies in the world and publicly states that it supports democracy (Fuchs & Vadlamannati, 2012, p. 15; Malhotra, 2019; Muni, 2019). They are one of the largest donors to the UN Democracy Fund and, within the speeches of world leaders where they publicly thank India for their donation, it is often stated that it is important that two democratic nations help each other (Fuchs & Vadlamannati, 2012, p. 15; Ministry of External Affairs India, 2021b). Therefore, it would not be odd if India supports democratic countries over more autocratic countries. However, the Indian government also vastly believes in non-interference and "does not believe in the export of ideologies" (Malhotra, 2019). Therefore, it seems to be that India might not have used vaccine diplomacy as a tool to promote democracy worldwide but rather as an unconscious bias toward more democratic countries.

The two most interesting findings for the case of India that paints a picture of how vaccine donations are an extension of foreign policy are the country-specific political variables of India. Indian diaspora engagement is an important part of India's foreign policy strategy and it is justifiable to test whether the presence of a large Indian diaspora in a country influences how

India acts towards a country. Apparently, the proportion of people of Indian descent in a country was significant for the amount of vaccine donations per capita a country got. When one looks at Latin America and Sub-Saharan Africa again, it becomes apparent that the countries that have the highest diaspora per capita, also got the most vaccine donations per capita. Surprisingly, the Americas and Africa have a few of the countries with the highest Indian diaspora per capita—Mauritius, Suriname, Guyana, and Trinidad & Tobago. That these countries have a large Indian diaspora, however, is not too surprising considering their long history of indentured labor—an exploitative system, grounded in both coercion and neglect, that was put in place to replace slavery and brought many people of Indian descent overseas—while being relatively small in population size (Sturman, 2014, pp. 1440-1441). For example, in Africa, it becomes apparent that the countries with the highest Indian diaspora per capita—Mauritius and Seychelles—also get the most vaccine donations per capita.

Next to the political variable of Indian diaspora, also whether a country supports Taiwan is significant and positive. It is quite extraordinary to note that whereas China did not donate vaccines to any country that recognizes Taiwan, India donated to 62% of the countries that support Taiwan. Within the Americas, it becomes apparent that, even though Guatemala and Paraguay do not have a large Indian diaspora, they still received a donation. The only countries in the Americas that do recognize Taiwan but did not receive any vaccine donations are Honduras and Haiti. It is not clear why these countries did not receive any vaccines. That Taiwan relations is an important determinant could be considered rather puzzling. However, it could be considered as a way to push back on China considering their troubled relationship and pull the countries that do not have a diplomatic relationship with China closer to them (Malhotra, 2019). According to Smith (2022), India and Taiwan have quietly enhanced economic and political

relations with Taiwan over the past few years. In India's view, China did not recognize India's sovereignty over Kashmir in 2010 and since then India has refrained from publicly stating the 'One China Policy' (Smith, 2022). In 2018, the Indian parliament's standing committee on external affairs released a report that stated that India is overly cautious about China's sensitivities regarding Taiwan and Tibet, while China does not show the same sensitivity when it comes to India's sovereignty issues (Smith, 2022).

Conclusion

It seems rather safe to state that all the existing evidence combined with these new empirical results for the COVID-19 pandemic leads one to think that bilateral foreign aid—also in the case of vaccine donations—is an extension of foreign policy, as Apodaca (2017) suggested. Political variables are prevalent in the regressions, while variables of need generally seem to be less important. These political variables generally align with foreign policy goals that existed prior to the COVID-19 pandemic. China likes to give to countries that are allies, developing, do not recognize Taiwan, are part of the BRI, and are geographically closer. The United States gives to countries that they have a high trade level with and are democratic. And India gives to countries that they are politically aligned with, are democratic, recognize Taiwan, and have a large Indian diaspora. Some results were surprising, for example, that the United States gives to countries that are not politically aligned with them and China to countries that they have a low trade level with, but can partly be explained by the data or not further research.

The COVID-19 pandemic has hit the whole world and put everyone in the same situation. Global powers had the choice to either help the whole world selfishly or pursue foreign policy goals while doing so. It seems to be clear that the latter prevailed, which led to positive results for some and dire results for others. Countries like Bangladesh, Myanmar, Cambodia, and

Mexico benefitted from having good ties with a few of the world's biggest vaccine powers and fitting within their foreign policy strategy. Yet, countries like Kazakhstan, Bulgaria, Yemen, South Sudan, and Libya, which do not have close ties with these three countries, did not receive any vaccine donations from these countries. Even though even in July 2022 they could use the vaccines (see *Figure 6*). It begs the question of whether this bilateral foreign aid system is just.

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Appendix

Table 2. Summary Table of all possible dependent variables regarding vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Total Donations	555	402,772	1.596e+06	0	1.924e+07
Donations per capita	555	0.0510	0.154	0	1.400
Log of Donations per capita (+1)	555	-11.58	6.332	-21.05	0.336
Log of Total Donations (+1)	555	4.057	5.968	0	16.77
If Donated	555	0.323	0.468	0	1
Percentage of Donated Donations	555	0.00528	0.0214	0	0.240

Table 3. Summary Table of all possible dependent variables regarding China's vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Total Donations	185	723,953	2.138e+06	0	1.924e+07
Donations per capita	185	0.0722	0.184	0	1.400
Log of Donations per capita (+1)	185	-9.132	6.663	-21.00	0.336
Log of Total Donations (+1)	185	6.497	6.580	0	16.77
If Donated	185	0.503	0.501	0	1
Percentage of Donated Donations	185	0.00533	0.0157	0	0.142

Table 4. Summary Table of all possible dependent variables regarding U.S. vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Total Donations	185	410,217	1.661e+06	0	1.460e+07
Donations per capita	185	0.0466	0.135	0	0.782
Log of Donations per capita (+1)	185	-12.87	5.896	-21.05	-0.245
Log of Total Donations (+1)	185	2.772	5.448	0	16.50
If Donated	185	0.211	0.409	0	1
Percentage of Donated Donations	185	0.00513	0.0208	0	0.183

Table 5. Summary Table of all possible dependent variables regarding India's vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Total Donations	185	74,146	363,129	0	3.300e+06
Donations per capita	185	0.0343	0.135	0	0.981
Log of Donations per capita (+1)	185	-12.73	5.706	-21.05	-0.0192
Log of Total Donations (+1)	185	2.902	5.029	0	15.01
If Donated	185	0.254	0.437	0	1
Percentage of Donated Donations	185	0.00539	0.0264	0	0.240

Table 6. Summary Table of all possible independent variables regarding vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Agreement Score of UN Voting	555	0.657	0.229	0.193	0.940
Trade Level	555	0.0935	0.126	0	0.856
Freedom House Score	555	0.593	0.294	0	1
Taiwan	555	0.0703	0.256	0	1
Belt and Road Initiative	555	0.771	0.420	0	1
Total Deaths per million	555	452.9	636.9	0	4,164
Total Vaccinations per hundred	555	5.366	13.08	0	107.1
Log of GDP per capita	555	8.642	1.398	5.560	11.64
Log of Distance	555	8.919	0.562	6.527	9.868
Log of Population	555	15.63	2.133	9.257	21.05
Log of Indian Diaspora per capita	553	-7.435	3.113	-19.13	-0.345

Table 7. Summary Table of all possible independent variables regarding China's vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Agreement Score of UN Voting	185	0.817	0.121	0.273	0.940
Trade Level	185	0.145	0.115	0.00121	0.793
Freedom House Score	185	0.595	0.293	0	1
Taiwan	185	0.0703	0.256	0	1
Belt and Road Initiative	185	0.768	0.424	0	1
Total Deaths per million	185	456.0	639.7	0	4,164
Total Vaccinations per hundred	185	5.434	13.22	0	107.1
Log of GDP per capita	185	8.643	1.405	5.560	11.64
Log of Distance	185	9.012	0.495	6.862	9.868
Log of Population	185	15.63	2.131	9.257	21.00

Table 8. Summary Table of all possible independent variables regarding U.S. vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Agreement Score of UN Voting	185	0.383	0.128	0.193	0.863
Trade Level	185	0.0998	0.152	0.00117	0.856
Freedom House Score	185	0.591	0.295	0	1
Total Deaths per million	185	447.2	634.6	0	4,164
Total Vaccinations per hundred	185	5.218	12.87	0	107.1
Log of GDP per capita	185	8.632	1.394	5.560	11.64
Log of Distance	185	8.986	0.524	6.603	9.703
Log of Population	185	15.64	2.148	9.257	21.05

Table 9. Summary Table of all possible independent variables regarding India's vaccine donations.

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Agreement Score of UN Voting	185	0.771	0.109	0.292	0.904
Trade Level	185	0.0358	0.0759	0	0.748
Freedom House Score	185	0.592	0.295	0	1
Taiwan	185	0.0703	0.256	0	1
Total Deaths per million	185	455.4	640.0	0	4,164
Total Vaccinations per hundred	185	5.447	13.22	0	107.1
Log of GDP per capita	185	8.651	1.402	5.560	11.64
Log of Distance	185	8.760	0.628	6.527	9.737
Log of Population	185	15.63	2.132	9.257	21.05
Log of Indian Diaspora per capita	185	-7.434	3.118	-19.13	-0.345

Table 10. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations per capita (+1)

	(1) China	(2) United States	(3) India
Agreement Score of UN Voting	17.65***	-9.107*	15.36**
	(5.110)	(4.167)	(4.914)
Trade Level	-8.422*	19.91***	10.29
	(3.934)	(3.608)	(5.513)
Freedom House Score	3.164	5.626**	5.910**
	(1.889)	(1.707)	(1.829)
Log of Distance	-2.209*	0.832	-0.269
	(0.917)	(1.052)	(0.722)
Log of GDP per capita	-1.868***	0.0901	-0.673
	(0.401)	(0.354)	(0.393)
Total Deaths per million	-0.00111	0.000830	-0.00108
	(0.000742)	(0.000687)	(0.000662)
Total Vaccinations per hundred	-0.0185	-0.0474	0.0124
	(0.0349)	(0.0314)	(0.0304)
Taiwan	-1.968		6.706***
	(1.847)		(1.427)
Belt and Road Initiative	2.218		
	(1.224)		
Log of Indian Diaspora per capita			0.569***
			(0.144)
Constant	10.92	-22.99*	-16.05*
	(9.298)	(10.26)	(7.804)
Adjusted R^2	0.3698	0.3252	0.3439
Observations	183	183	183

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations per capita (+1) when population > 200,000

	(1) China	(2) United States	(3) India
Agreement Score of UN Voting	24.07***	-14.04**	15.51*
	(6.233)	(4.977)	(5.960)
Trade Level	-8.493*	19.76***	11.00*
	(3.936)	(4.456)	(5.532)
Freedom House Score	2.079	4.835**	5.274**
	(1.976)	(1.790)	(1.897)
Log of Distance	-2.215*	0.846	-0.402
	(0.912)	(1.165)	(0.728)
Log of GDP per capita	-1.871***	0.150	-0.699
	(0.403)	(0.365)	(0.401)
Total Deaths per million	-0.000219	0.00169*	-0.000739
	(0.000789)	(0.000720)	(0.000697)
Total Vaccinations per hundred	-0.0138	-0.0331	0.00512
	(0.0357)	(0.0325)	(0.0313)
Taiwan	-6.098*		6.543**
	(2.456)		(1.973)
Belt and Road Initiative	1.389		
	(1.251)		
Log of Indian Diaspora per capita			0.549***
			(0.146)
Constant	6.380	-22.06	-14.93
	(9.986)	(11.35)	(8.361)
Adjusted R^2	0.4181	0.2761	0.2854
Observations	167	167	167

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations (+1)

	(1) China	(2) United States	(3) India
Agreement Score of UN Voting	20.30***	-9.585*	17.60***
	(4.602)	(3.984)	(4.627)
Trade Level	-5.156	18.82***	12.63*
	(3.564)	(3.458)	(5.187)
Freedom House Score	-0.419	3.337*	4.163*
	(1.780)	(1.720)	(1.750)
Log of Distance	-2.753**	0.733	-0.622
	(0.827)	(1.006)	(0.680)
Log of GDP per capita	-2.114***	0.0157	-0.517
	(0.361)	(0.339)	(0.370)
Total Deaths per million	0.000459	0.00164*	-0.000405
	(0.000707)	(0.000684)	(0.000635)
Total Vaccinations per hundred	-0.0158	-0.0419	0.0175
	(0.0313)	(0.0300)	(0.0285)
Log of Population	-0.378	0.221	0.0338
	(0.210)	(0.185)	(0.193)
Taiwan	-6.420***		4.637**
	(1.791)		(1.400)
Belt and Road Initiative	0.398		
	(1.132)		
Log of Indian Diaspora per capita			0.365*
			(0.141)
Constant	39.90***	-8.071	-1.727
	(9.440)	(10.43)	(7.855)
Adjusted R^2	0.4906	0.2912	0.2702
Observations	183	183	183

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 13. Logistic regressions of the effect of Political and Need variables on If Vaccines were Donated

	(1) China	(2) United States	(3) India
Agreement Score of UN Voting	17.57***	-6.140*	12.94**
	(4.066)	(2.775)	(3.968)
Trade Level	-6.003**	12.69***	10.26
	(2.101)	(3.520)	(6.039)
Freedom House Score	1.434	2.345*	2.561*
	(1.004)	(1.120)	(1.134)
Log of Distance	-1.310*	1.110	-0.118
	(0.542)	(0.752)	(0.435)
Log of GDP per capita	-0.979***	0.0854	-0.0953
	(0.252)	(0.233)	(0.259)
Total Deaths per million	0.000493	0.00107*	-0.000907
	(0.000454)	(0.000542)	(0.000725)
Total Vaccinations per hundred	-0.0409	-0.0610	-0.00189
	(0.0264)	(0.0336)	(0.0209)
Taiwan	0		2.757**
	(.)		(0.876)
Belt and Road Initiative	1.834*		
	(0.856)		
Log of Indian Diaspora per capita			0.174*
			(0.0859)
Constant	4.223	-12.87	-10.12
	(5.487)	(7.184)	(5.551)
Adjusted R^2			
Observations	170	183	183

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 14. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations per capita (+1) donated by China.

	(1) China	(2) China	(3) China	(4) China	(5) China
Agreement Score of UN Voting	27.29***	20.82***	18.84***	18.10***	17.65***
	(5.083)	(5.085)	(5.101)	(5.095)	(5.110)
Trade Level	-1.094	-7.064	-7.831*	-8.286*	-8.422*
	(4.136)	(3.978)	(3.946)	(3.933)	(3.934)
Freedom House Score	-1.044	2.664	2.758	3.246	3.164
	(1.894)	(1.910)	(1.888)	(1.888)	(1.889)
Log of Distance	-1.841	-2.622**	-2.261*	-2.339*	-2.209*
	(0.955)	(0.920)	(0.923)	(0.909)	(0.917)
Log of GDP per capita		-1.992***	-1.993***	-1.831***	-1.868***
		(0.402)	(0.397)	(0.399)	(0.401)
Total Deaths per million		-0.000679	-0.00102	-0.00100	-0.00111
		(0.000738)	(0.000745)	(0.000735)	(0.000742)
Total Vaccinations per hundred		-0.00845	-0.0200	-0.0134	-0.0185
		(0.0351)	(0.0351)	(0.0346)	(0.0349)
Taiwan			-3.649*		-1.968
			(1.608)		(1.847)
Belt and Road Initiative				2.873**	2.218
				(1.059)	(1.224)
Constant	-14.01	14.55	13.45	10.62	10.92
	(8.362)	(9.349)	(9.253)	(9.297)	(9.298)
Adjusted R^2	0.2319	0.3464	0.3615	0.3693	0.3698
Observations	183	183	183	183	183

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations (+1) donated by China

	(1) China	(2) China	(3) China	(4) China	(5) China
Agreement Score of UN Voting	27.02***	23.54***	20.54***	21.01***	20.30***
	(4.728)	(4.736)	(4.542)	(4.753)	(4.602)
Trade Level	0.746	-4.281	-5.013	-5.455	-5.156
	(3.847)	(3.719)	(3.532)	(3.683)	(3.564)
Freedom House Score	-3.359	-0.0389	-0.534	0.553	-0.419
	(1.761)	(1.836)	(1.745)	(1.819)	(1.780)
Log of Distance	-2.149*	-3.277***	-2.769***	-3.005***	-2.753**
	(0.888)	(0.860)	(0.824)	(0.852)	(0.827)
Log of GDP per capita		-2.108***	-2.138***	-1.960***	-2.114***
		(0.373)	(0.354)	(0.371)	(0.361)
Total Deaths per million		0.000769	0.000495	0.000440	0.000459
		(0.000733)	(0.000698)	(0.000731)	(0.000707)
Total Vaccinations per hundred		0.00268	-0.0161	-0.00204	-0.0158
		(0.0326)	(0.0312)	(0.0321)	(0.0313)
Log of Population		-0.119	-0.396	-1.092***	-1.378***
		(0.204)	(0.203)	(0.201)	(0.210)
Taiwan			-6.762***		-6.420***
			(1.500)		(1.791)
Belt and Road Initiative				2.603**	0.398
				(0.983)	(1.132)
Constant	5.665	37.14***	40.71***	33.04***	39.90***
	(7.779)	(9.591)	(9.134)	(9.556)	(9.440)
Adjusted R^2	0.3325	0.4369	0.4932	0.4581	0.4928
Observations	183	183	183	183	183

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations per capita (+1) and Vaccine Donations (+1) donated by the United States

	(1) Log of Donations per capita (+1)	(2) Log of Donations per capita (+1)	(3) Log of Total Donations (+1)	(4) Log of Total Donations (+1)
Agreement Score of UN Voting	-9.092*	-9.107*	-7.822*	-9.585*
	(3.663)	(4.167)	(3.564)	(3.984)
Trade Level	18.42***	19.91***	16.01***	18.82***
	(3.484)	(3.608)	(3.390)	(3.458)
Freedom House Score	6.124***	5.626**	3.227*	3.337
	(1.647)	(1.707)	(1.602)	(1.720)
Log of Distance	0.347	0.832	-0.193	0.733
	(1.009)	(1.052)	(0.981)	(1.006)
Log of GDP per capita		0.0901		0.0157
		(0.354)		(0.339)
Total Deaths per million		0.000830		0.00164*
		(0.000687)		(0.000684)
Total Vaccinations per hundred		-0.0474		-0.0419
		(0.0314)		(0.0300)
Log of Population				0.221
				(0.185)
Constant	-17.88	-22.99*	4.022	-8.071
	(9.607)	(10.26)	(9.346)	(10.43)
Adjusted R^2	0.3227	0.3252	0.2628	0.2912
Observations	183	183	183	183

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations per capita (+1) donated by India

	(1) India	(2) India	(3) India	(4) India	(5) India
Agreement Score of UN Voting	18.42***	14.28**	18.84***	10.78*	15.36**
	(5.027)	(5.261)	(5.034)	(5.100)	(4.914)
Trade Level	18.38**	16.91**	15.74**	10.75	10.29
	(5.844)	(5.906)	(5.558)	(5.836)	(5.513)
Freedom House Score	6.204***	6.920***	7.371***	5.333**	5.910**
	(1.850)	(1.982)	(1.866)	(1.933)	(1.829)
Log of Distance	0.390	0.371	-0.575	0.635	-0.269
	(0.769)	(0.767)	(0.747)	(0.737)	(0.722)
Log of GDP per capita		0.113	0.0885	-0.735	-0.673
		(0.380)	(0.357)	(0.416)	(0.393)
Total Deaths per million		-0.00235***	-0.00181**	-0.00149*	-0.00108
		(0.000694)	(0.000662)	(0.000694)	(0.000662)
Total Vaccinations per hundred		0.00729	0.0252	-0.00543	0.0124
		(0.0332)	(0.0314)	(0.0319)	(0.0304)
Taiwan			7.238***		6.706***
			(1.479)		(1.427)
Log of Indian Diaspora per capita				0.633***	0.569***
				(0.152)	(0.144)
Constant	-34.64***	-31.60***	-27.70***	-18.33*	-16.05*
	(6.468)	(7.958)	(7.525)	(8.247)	(7.804)
Adjusted R^2	0.1568	0.1954	0.2886	0.2644	0.3439
Observations	183	183	183	183	183

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18. Random Intercept Model of the effect of Political and Need variables on the log of Vaccine Donations (+1) donated by India

	(1) India	(2) India	(3) India	(4) India	(5) India
Agreement Score of UN Voting	18.71***	17.53***	19.98***	15.15**	17.60***
	(4.373)	(4.671)	(4.609)	(4.697)	(4.627)
Trade Level	18.01***	16.94**	16.19**	13.39*	12.63*
	(5.084)	(5.218)	(5.085)	(5.330)	(5.187)
Freedom House Score	4.188*	4.050*	4.757**	3.456	4.163*
	(1.610)	(1.797)	(1.763)	(1.786)	(1.750)
Log of Distance	-0.162	-0.354	-0.855	-0.121	-0.622
	(0.669)	(0.686)	(0.685)	(0.682)	(0.680)
Log of GDP per capita		-0.0558	-0.0467	-0.526	-0.517
		(0.336)	(0.327)	(0.380)	(0.370)
Total Deaths per million		-0.000860	-0.000730	-0.000534	-0.000405
		(0.000648)	(0.000632)	(0.000651)	(0.000635)
Total Vaccinations per hundred		0.0155	0.0258	0.00722	0.0175
		(0.0294)	(0.0288)	(0.0291)	(0.0285)
Log of Population		-0.301	-0.112	-0.156	0.0338
		(0.184)	(0.188)	(0.190)	(0.193)
Taiwan			4.638**		4.637**
			(1.423)		(1.400)
Log of Indian Diaspora per capita				0.365*	0.365*
				(0.145)	(0.141)
Constant	-13.25*	-5.045	-6.414	-0.357	-1.727
	(5.626)	(7.969)	(7.769)	(8.067)	(7.855)
Adjusted R^2	0.1919	0.2044	0.2461	0.2281	0.2702
Observations	183	183	183	183	183

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 19. Random Intercept Model of the effect of Political and Need variables on the Log of Vaccine Donations per capita (+1) when GDP per capita < 10,000

	(1) China	(2) United States	(3) India
Agreement Score of UN Voting	21.13**	-3.194	4.123
	(7.425)	(5.870)	(7.438)
Trade Level	-10.89*	13.06*	12.29*
	(4.474)	(5.846)	(6.040)
Freedom House Score	4.279	4.807*	5.481*
	(2.339)	(2.152)	(2.359)
Log of Distance	-3.980***	0.0251	-0.532
	(1.107)	(1.384)	(0.846)
Log of GDP per capita	-1.199	1.437*	0.392
	(0.678)	(0.631)	(0.652)
Total Deaths per million	0.000394	0.00156	-0.00180
	(0.00100)	(0.000924)	(0.000933)
Total Vaccinations per hundred	-0.0232	0.0152	0.158
	(0.105)	(0.0977)	(0.0963)
Taiwan	-1.243		4.827**
	(2.652)		(1.776)
Belt and Road Initiative	5.314**		
	(1.989)		
Log of Indian Diaspora per capita			0.544**
			(0.181)
Constant	15.80	-27.14	-12.64
	(12.21)	(14.10)	(10.13)
Adjusted R^2	0.2325	0.2956	0.3071
Observations	117	117	117

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 6. Map of the world with the vaccination rate per hundred people.