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**Soft Power Measurement of
COVID-19 Vaccine Donations**

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Abstract

The COVID-19 pandemic disrupted global health, mobility, and supply chains on an unprecedented scale. Early on, vaccines were seen as a key to managing the pandemic, including reducing death rates and minimizing hospitalizations. Dire vaccine shortages in low- and middle-income countries prompted surplus-holding states to donate doses bilaterally, and multilaterally through COVAX. Actions that, beyond their humanitarian rationale, visibly signal scientific capability, manufacturing prowess, and a sense of global responsibility, thereby functioning as aspects of soft power. Yet cross-national evidence on whether such donations measurably enhanced donors' reputations remains scarce and fragmented across competing definitions and measures of soft power.

The thesis builds its theoretical framework by linking soft power and Global Health Diplomacy. Soft power is conceptualized as the ability to shape others' preferences through attraction, legitimacy, and credibility rather than through coercion or material inducements. It therefore has both a perceptual and a resource-based dimension. Global Health Diplomacy is treated as the use of health-related cooperation, assistance, and institutions as instruments of international engagement, where credibility, reciprocity, and alignment with shared norms can convert contributions to health into reputational and relational gains.

This thesis addresses the gap of cross-national evidence on donations' effect on soft power by revisiting classic and contemporary theories of power, situating vaccine donations within the field of Global Health Diplomacy, and by directly addressing a gap in the literature: the lack of a systematic comparison of the leading approaches to measuring soft power. The thesis remedies this by reviewing the main soft power measurements, assessing their advantages and limitations, and then selecting two complementary measures that represent key aspects of soft power. The perception-based Brand Finance Global Soft Power Index and the outcome-based Elcano Global Presence Index are used to build a composite indicator that fuses attraction and resource presence because existing measures only partially align with the theoretical concept of soft power, which combines both attraction and resources.

A novel global dataset is assembled to integrate those indices with pandemic severity, demographic, economic, and governance covariates. The composite indicator is then linked to per-capita vaccine donations through OLS models, allowing tests of hypotheses on donation channels (bilateral vs COVAX), regime type, and pandemic control success.

Initial results show statistically significant soft power gains for donors, with a clear advantage to donation via COVAX. The central theoretical implication is that the multilateral channel matters: COVAX donations more credibly signal cooperation, legitimacy, and “good global citizenship,” which are core mechanisms of Global Health Diplomacy and help explain how health contributions translate into reputational returns. The thesis further shows how these dynamics interact with regime type and the structure of soft-power measurement, helping clarify when democracies are advantaged and when high baseline reputations create ceiling effects that constrain observable gains.

This thesis makes three contributions. First, it provides a systematic, criteria-based review of major soft-power indices and clarifies their conceptual and empirical tradeoffs. Second, it develops a new measurement infrastructure for studying vaccine diplomacy and soft power: it demonstrates that existing measures do not fully match the theoretical concept of soft power and therefore introduces a composite indicator that combines perception-based and resource-based components, and it builds a novel cross-national dataset that integrates multiple soft-power measures, vaccine-donation volumes and channels, and key pandemic-era economic, demographic, and governance covariates in a single unified framework. Third, it advances an empirically grounded claim about how health assistance converts into reputational returns: COVID-19 vaccine donations routed through COVAX are more strongly associated with soft-power gains than bilateral donations, highlighting the importance of multilateral channels, credibility, and cooperation as mechanisms central to Global Health Diplomacy. This contribution strengthens the theoretical understanding of soft power and global health diplomacy in crisis conditions. It offers practical implications for decision-makers by suggesting that future medical donations are more likely to generate goodwill when designed and communicated through multilateral frameworks rather than purely bilateral delivery.

Hebrew Abstract

מגפת הקורונה (COVID-19) הביאה לקריסה של מערכות בריאות ברחבי העולם, עצרה את עולם התעופה, וגרמה לפגיעה חסרת תקדים בשרשרת האספקה עולמית. חיסוני קורונה סומנו מוקדם מאוד במגפה בתור כלי ההתמודדות מרכזי אשר הוביל להפחת מספר המתים ולמיתון מספר ואורך הזמן בו אושפזו בבתי חולים. כחלק מהמגפה נוצר מחסור חריף של חיסונים במדינות בעלות הכנסה נמוכה ובינונית, ולכן מדינות בעלות עודפים תרמו חיסונים בין אם באופן בילטרלי ובין אם כחלק ממאמץ גלובלי כגון COVAX. תרומת חיסונים, בנוסף לנימוק ההומניטרי בתרומתן, מייצרות מצג של פיתוח מדעי, יכולת יצור, ואחריות גלובלית של המדינה התרומת, ולפיכך הם מהווים מובנים של עוצמה רכה (soft power). עם זאת, קיים מחסור במחקר אקדמי הסוקר את העדויות ברמה הגלובלית לשאלה אם תרומות של חיסוני קורונה אכן שיפרו באופן מדיד את העוצמה הרכה המדינות התורמות.

תזה זו מבקשת לסגור את הפער שלעיל באמצעות עיון מחדש בתיאוריות קלאסיות ועכשוויות של עוצמה ועוצמה רכה, וממקמת את תרומות החיסונים במסגרת דיפלומטיית הבריאות העולמית (Global Health Diplomacy). המסגרת התיאורטית של התזה מקשרת באופן מפורש בין עוצמה רכה לבין דיפלומטיית בריאות עולמית. עוצמה רכה מוגדרת כיכולת לעצב את העדפותיהם של אחרים באמצעות משיכה, לגיטימציה, ואמינות - ולא באמצעות כפייה או תמריצים חומריים; ולכן יש לה גם ממד תפיסתי וגם ממד מבוסס משאבים. דיפלומטיית בריאות עולמית מוגדרת כשימוש בשיתופי פעולה, סיוע ומוסדות בתחום הבריאות ככלים למעורבות בינלאומית, שבהם אמינות, הדדיות, והלימה לנורמות משותפות יכולות להמיר תרומות לבריאות לרווחים תדמיתיים ויחסיים.

התזה סוקרת מדדים מובילים של עוצמה רכה, ועל בסיס המידע האימפרי הקיים בהן והאיכות המחקרית נבחרו שני מדדים משלימים. מדד Brand Finance Global Soft Power Index המבוסס על כיצד מדינה נתפסת בתודעה הבין-לאומית, ומדד Elcano Global Presence Index המבוסס על אינדקטורים אמפיריים. המדדים הללו משמשים לבניית מדד משולב המאחד בין תפיסתית ומשאבים אמפיריים, משום שמדדים קיימים תואמים רק באופן חלקי את המושג התיאורטי של עוצמה רכה, המחבר בין משיכה לבין משאבים, וקיים פער בספרות בהשוואה שיטתית בין גישות המדידה המובילות.

בתזה נבנה מאגר נתונים גלובלי המשלב את המדדים הללו עם משתנים מסבירים נוספים כגון חומרת המגפה, דמוגרפיה, כלכלה, ורמת הדמוקרטיה הליברלית של המדינה. לאחר מכן מוצגת שיטה לבחינת ההשפעה של תרומת חיסוני קורונה על עוצמה רכה המבוססת על מידע קיים, ובעזרת רגרסיות OLS נבחנות השערות ראשוניות האודות חשיבות אופן התרומה (ישיר לעומת COVAX), רמת הדמוקרטיה הליברלית

של המדינה התורמת, והצלחה בהתמודדות עם מגפת הקורונה. בפרט, המדד המשולב מתמקד בתרומות חיסונים לנפש, באופן המאפשר לבחון השערות על ערוצי תרומה (ישיר לעומת COVAX), רמת הדמוקרטיה, ומדדי מגפת הקורונה במדינה.

ממצאים ראשוניים מצביעים על עליה מובהקת וסטטיסטית בעוצמה הרכה של מדינות התורמות, עם יתרון ברור לתרומה באמצעות COVAX. ההשלכה התיאורטית המרכזית היא שתרומה דרך מנגנון רב-לאומי הוא גורם מכריע: תרומות דרך COVAX מאותתות על שיתוף פעולה, לגיטימציה ו"אזרחות גלובלית טובה", שהם מנגנונים ליבתיים בדיפלומטיית בריאות עולמית ומסייעים להסביר כיצד תרומות בריאות מתורגמות לעוצמה רכה. התזה גם מראה כיצד דינמיקות אלה משתלבות עם רמת הדמוקרטיה של המדינה ועם שיטות מדידת העוצמה הרכה השונות.

תזה זו מציעה שלוש תרומות. ראשית, היא מספקת סקירה שיטתית, מבוססת קריטריונים, של מדדי עוצמה רכה מרכזיים ומבהירה את הפשרות המושגיות והאמפיריות הכרוכות בהם. שנית, היא מפתחת תשתית מדידה חדשה לחקר דיפלומטיית חיסונים ועוצמה רכה. היא מדגימה שמדדים קיימים אינם תואמים במלואם את המושג התיאורטי של עוצמה רכה, ולכן מציגה מדד משולב המאחד רכיבים תפיסתיים ורכיבים מבוססי־משאבים, ובונה מאגר נתונים השוואתי חדש המשלב מספר מדדי עוצמה רכה, היקפי תרומות חיסונים וערוצי תרומה, ומשתני בקרה כלכליים, דמוגרפיים, ורמת הדמוקרטיה של המדינה, בתקופה שבין 2019-2024 למסגרת אחודה אחת של נתונים. שלישית, היא מקדמת טענה אמפירית מבוססת נתונים לגבי האופן שבו סיוע בריאותי מתורגם לעוצמה רכה: תרומות חיסוני COVID-19 דרך COVAX קשורות ברמה גבוהה יותר לעלייה בעוצמה רכה מאשר תרומות ישירות, ובכך מדגישות את חשיבותם של ערוצים רב־לאומיים, אמינות, ושיתוף פעולה - כמנגנונים מרכזיים בדיפלומטיית בריאות עולמית. תרומה זו של התזה מחזקת את ההבנה התיאורטית של עוצמה רכה ודיפלומטיית בריאות עולמית בתנאי משבר, ומציעה גם השלכות מעשיות למקבלי החלטות, בכך שהיא מצביעה על כך שתרומות רפואיות עתידיות צפויות לייצר יותר רצון טוב (goodwill) כאשר הן חלק ממסגרת רב-לאומית ולא באמצעות תרומה ישירה בלבד.

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Introduction

The COVID-19 pandemic, which fully emerged in early 2020, created the most disruptive global health crisis in a generation. Within weeks, hospitals rationed intensive care beds, international passenger traffic halted to a full stop, and the supply chains were severely disrupted. The rapid development of multiple safe and effective vaccines offered the key exit strategy, yet early production bottlenecks and advance purchase agreements concentrated supply in a handful of high-income economies. For the rest of the world, especially low- and middle-income countries, shortages persisted well into 2022. In response, surplus holding and manufacturing states began donating vaccines abroad, either bilaterally or through organized donations such as COVAX. While these donations were given from goodwill, those donations from a realist view simultaneously projected technological capability, medical achievements, and responsibility for global health and order, turning vaccine shipments into a key element for soft power.

This thesis examines those signals through the lens of soft power. Soft power, as formulated by Nye, refers to the capacity to influence others through attraction rather than coercion or payment (Nye, Joseph S., 2004, 2011). Unlike military strength or economic strength, which are relatively tangible and straightforward to count, the cultural appeal, normative legitimacy, and reputational credibility that comprise soft power (by different measurements) are difficult to observe and measure directly. Vaccine donations are a new and unique case study of these dynamics. They are concrete acts of assistance that may reshape perceptions of a donor's competence (such as scientific prowess, manufacturing efficiency) and character (such as altruism, responsibility), attributes that are often considered especially prominent for democratic states that prefer to persuade rather than compel (Gallarotti, 2011).

Academic research on pandemic-era soft power has been fragmented: many case studies for China, the United States, India, or the European Union, yet no cross-national global analysis has systematically tested whether, and under what conditions, vaccine donations moved the needle of soft power.

This thesis fills that gap by asking **how to measure the effect of COVID-19 vaccine donations on soft power**.

This thesis revisits the evolution of power in international relations theory, clarifying the concept of soft power by comparing it to adjacent concepts such as normative and smart power. It establishes vaccine donations within the broader field of Global Health Diplomacy (GHD) to expose the distinctive signaling mechanisms attached to life-saving technologies.

Then, this thesis reviews the available soft power indexes in order to evaluate their relevance for a global measurement of soft power gain during the pandemic. Evaluating the indexes by quality of the index, the scope of countries covered, and covering the COVID-19 era. While reviews of specific soft power indexes exist, with some reviews comparing a few indexes, there is a lack of a comprehensive review of all major soft power indexes. Based on the evaluation, the Brand Finance Global Soft Power Index and the Elcano Global Presence Index are chosen in this thesis for developing a composite indicator that fuses perception-based and outcome-based soft power measurements.

Methodologically, the thesis creates a data set composed of two soft power measurements, a combined measurement that fuses the two, and augments the data set with key data points such as pandemic severity, GDP, population, size, V-DEM score, and others. With this robust data, a suggested soft power measurement of COVID-19 vaccine donation is created – one that is global and can be put to the test using the data set. And so multiple hypotheses are put to the OLS test to exemplify the value of the data set and power measurement. These include evaluating the difference in soft power between various mechanisms of vaccine donations, the impact of the liberal democracy level, the success in overcoming the pandemic, and more.

The findings advance the wider conversation on soft power and medical diplomacy. The thesis contributes to health diplomacy by embedding vaccine donations within a clear IR power framework, treating them as soft (and smart) power resources within global health diplomacy and demonstrating that their reputational consequences can be analyzed systematically on a global scale. It further contributes to soft power theory by developing and testing a composite perception and resources indicator (combining the GSPI and the Elcano soft component) to measure how COVID-19 vaccine donations, especially via COVAX, are associated with measurable soft power gains for donor states. In addition, the thesis offers a valuable review of existing soft power measurements, which can be used for future analyses of soft power and for

understanding the limitations of current measurement approaches, and it introduces a dataset combining multiple data sources that enables further research into questions of soft power and pandemics from a global, data-driven perspective. For decision-making in international relations, the thesis provides empirical, data-driven evidence of the diplomatic dividends of foreign aid allocations.

The thesis is organized as follows. The first chapter outlines the pandemic context and the emergence of vaccine shortages and donations. The second reviews theories of power with emphasis on soft power and related concepts. The third situates vaccine donations within global health diplomacy and considers parallels to other policy arenas. The fourth reviews theories of power and soft power measurement. The fifth develops the measurement approach, describes the dataset, explains the empirical strategy, presents results, discusses their implications for international cooperation and foreign-policy practice, and identifies avenues for future research.

Chapter 1: COVID-19 and Vaccine Development

COVID-19: A Chronicle of a Pandemic

The start of the Pandemic

The New Year of 2020 was welcomed across the world with celebrations, from fireworks in Sydney to the famous ball dropping in New York City; the world embraced the new year. Parties raged into the night, new year's resolutions to hit the gym, and many students were gearing up for the second term of the year. No one even imagined that in just four months, parties would be prohibited, gyms closed, schools would be teaching online using Virtual Communication tools such as Zoom, and the whole world would come to an abrupt stop. The world as we know it changed forever. Behind the scenes, invisible to the naked eye, a virus known yet unknown at the same time was spreading, and spreading at an alarming speed.

The Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), previously known as the 2019 novel coronavirus (2019-nCoV), is the culprit of the pandemic that caused this disaster, now known as the COVID-19 pandemicⁱ. As can be understood from the virus name, it started to spread already in 2019 and is related to the SARS-CoV-1 virus that caused the 2002–2004 SARS outbreak (Singhal, 2020).

The COVID-19 virus source of outbreak was identified in Wuhan (China), moving from animals to humans in the Huanan wet market (Singhal, 2020). Some called it the “Wuhan coronavirus” or the “Chinese virus,” mostly for propaganda purposes (Su et al., 2020). COVID-19 spread quickly. Interest moved from mostly Chinese experts in December 2019 to world experts by January 2020 (Singhal, 2020). While it was still seen as spreading only in China, the WHO began mobilizing in preparation for a Health Emergency (Jee, 2020; Khanna et al., 2020). At the end of January, high-publicity events made clear the pandemic was real and worrisome: the first U.S. case on 15

ⁱ In this thesis the shorten name “COVID-19” will be used

January, then cases in Japan and France; on 30 January, the WHO declared a Public Health Emergency of International Concern (Bergquist et al., 2020; Cucinotta & Vanelli, 2020; Holshue et al., 2020). By month's end over 20 countries reported cases, with worried citizens of the world followed the spread of the COVID-19 virus in the COVID-19 Dashboard by the Centre for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU), a novelty in pandemic coverage that demonstrated the new ways information was processed and made accessible in the new age of information (Dong et al., 2020).

In February, reports of deaths in the United States and the Diamond Princess quarantine in Yokohama drew dramatic attention (Nakazawa et al., 2020; Stein, R. A., 2020). By the month's close, there were ~80,000 confirmed cases in China and ~9,000 across 60+ countries (Dong et al., 2020). March marked a rapid global escalation: spread to 150+ countries, epicenters in Italy, Spain, and Iran, U.S. daily cases over 15,000, and global daily cases surpassing 60,000; by 26 March, confirmed cases exceeded 500,000 with 24,000+ fatalities (Dong et al., 2020; Wouters et al., 2021). On 11 March 2020, the WHO declared COVID-19 a global pandemic (Cucinotta & Vanelli, 2020).

Fighting the Pandemic

Fighting an invisible foe is always a challenge, and so was fighting the COVID-19 pandemic. Requiring epidemiological knowledge and scientific research combined with Public Policy measures and communicating them to the public. All of this required not only tight coordination between scientists, politicians, and journalists, but also required trust in each and every one of them at a time when the concept of truth was challenged by populism.

The initial response to the COVID-19 pandemic by the Chinese government was to quarantine the “ground zero” in China (Tang et al., 2020), and internationally to test travelers arriving from China. Quickly, this turned into 14 days of self-quarantine for arrivals from China and denial of access to foreigners arriving from China (Chatterjee et al., 2020). By late February, Italy became the hot spot for COVID-19, leading to the Italian government issuing Decree-Law No. 6, which effectively locked down the country (Canestrini, 2020). In the following weeks, the CDC of the USA will issue a “no sail order” for all cruise ships (Brewster et al., 2020) and encouraged all

high-risk individuals to avoid face-to-face contact. Shortly afterwards, the USA States began implementing shutdowns – closing schools, restaurants, bars, and public places of gathering. Many other countries followed suit and ordered a complete country-wide shutdown and social distancing rules (Alexander, M. et al., 2022).

The scene at the end of March 2020 was unprecedented in modern history. The world came to a complete and utter standstill. The global economic system that shaped the world in the twentieth and twenty-first centuries was brought to an abrupt halt. Supply chains disrupted from bottom to top – factories closed, airplanes grounded, most shops closed or limited working hours, contracts canceled, and employees fired. Tourism evaporated, business meetings were moved to Virtual Communication systems (VC), and schools scrambled to move to remote teaching (Courtemanche et al., 2020).

But while most of the population was sheltering at home, medical staff were at the forefront. There was no medical protocol for treating COVID-19 (Peng et al., 2020). Medical devices and tools for detecting, preventing, and treating the virus were scarce – not only because no one anticipated they would be needed in such quantities, but also because the global supply chain was breaking down (Kaushik et al., 2022). Ventilators or respirators were needed to help COVID-19 patients survive the attack on their breathing system. PCR (Polymerase Chain Reaction) components, such as swab tips and PCR machines used to analyze samples, were key for detecting COVID-19 infections (Vermeiren et al., 2020). Finally, full Personal Protective Equipment (PPE) was critical for medical teams, as it was not known at that time how COVID-19 spread (Cohen & van der Meulen Rodgers, 2020). The international race to stockpile as many medical devices as possible was on, creating a Zero-sum game (Rhodes, 2021). With all abilities fair game, countries such as Israel used the Mossad, its national intelligence agency, for covert missions aimed at purchasing medical equipment (Kahana, 2021). This lack of global cooperation at the state level would become a recurring theme of the pandemic (Javed & Chattu, 2020).

After the first wave of COVID-19, the world was still confused regarding the proper measures to combat the virus. As time passed, some critical pieces of knowledge emerged. The first was the importance of testing and quarantining – stopping the chain of infection became a clear and immediate epidemic tool in the arsenal for minimizing the spread of COVID-19. The second was

the importance of social distancing and using face masks. This was part of a better understanding of how COVID-19 spread. Allowing a much more focused attempt to minimize the effect of the pandemic, and to communicate in an effective way with the terrified population (Cartaud et al., 2020; Deng & Chen, 2022; Kwon et al., 2021). Also, global corporations contributed to the fight. With Apple and Alphabet (Google's mother company), on a rare occasion, joining forces to develop tools for detecting close distance between people, in order to track who was next to a COVID-19 virus carrier (Gvili, 2020). Yet after a second wave of the pandemic in mid-late 2020, it was becoming clear that without a new and effective medicine, COVID-19 would continue to impact and the tool of death would continue for several more years. The solution seemed clear – develop a vaccine, just as Smallpox and other diseases were eradicated by a vaccine, so could COVID-19. Yet never has a vaccine been developed in such a short time, but never has the global technology been so advanced and poised for the mission (Cleve, 2021).

COVID-19 Vaccine Development and Donation

Vaccine Development – a Short History

The development of vaccines has been a cornerstone of public health, preventing countless diseases and saving millions of lives. However, creating vaccines, particularly for rapidly emerging infectious diseases such as SARS, presents unique challenges. This section will delve into the historical evolution of vaccine development, explore the various types of vaccines available, and examine the specific hurdles encountered in developing vaccines for past pandemics, such as SARS. By understanding these challenges, we can better appreciate the complexities involved in creating effective vaccines against new and emerging threats.

A little over a century ago, infectious diseases like measles, diphtheria, smallpox, and pertussis were prevalent, with high infant and childhood mortality rates. However, the development and widespread distribution of safe, effective, and affordable vaccines have successfully contained many of these diseases, particularly in industrialized nations (Dobson & Carper, 1996). Immunization is widely regarded as the most significant achievement in public health, saving countless lives and halting the spread of harmful microbes. Vaccines embody the utmost promise

of biomedicine by offering unparalleled disease prevention capabilities (Greenwood, 2014; Maurice & Davey, 2009).

The concept of vaccination dates back to ancient times, when people observed that individuals who recovered from certain infections became immune to future infections. Ever since, vaccines have played a crucial role in preventing and eradicating infectious diseases throughout history (Greenwood, 2014). Human vaccinology was developed and is based on much work in veterinary medicine, which initially focused on animal health (Lombard et al., 2007). The term "herd immunity," commonly used in English, originates from the veterinary concept of safeguarding the health of an entire herd. Vaccination is predominantly a public health tool, targeting populations rather than individuals (Frederiksen et al., 2020; Smith, P. G., 2010).

In 1796, Edward Jenner, an English physician, conducted an experiment that marked the birth of modern vaccination. He observed that milkmaids who contracted cowpox, a relatively mild disease, seemed to be immune to smallpox. Jenner hypothesized that exposure to cowpox could protect against smallpox, a deadly and highly contagious disease. He subsequently inoculated a young boy with material from a cowpox sore and later exposed the boy to smallpox, proving that the cowpox inoculation had indeed conferred immunity (Lombard et al., 2007; Smith, K. A., 2011).

Belgian physician Louis Willems modernized the ancient practice of inoculation by inoculating animals with a small amount of infectious material in 1853. This marked a shift towards studying tissues rather than just bodily fluids under the microscope, and towards employing various techniques to achieve permanent attenuation or neutralization. The experiences of animal farmers and veterinary practices thus formed the historical foundation for contemporary vaccinology (Lombard et al., 2007).

As Jenner gained recognition across Europe, his vaccination method became a cornerstone of emerging national health programs. Kings and presidents embraced large-scale vaccination campaigns to demonstrate their commitment to science and the well-being of their citizens. By 1800, approximately 100,000 individuals had been vaccinated in Europe, and vaccination efforts had commenced in the United States, led by Harvard professor Benjamin Waterhouse and President Thomas Jefferson (Leavell, 1977). King Charles IV of Spain even dispatched the

Balmis Expedition in 1803 to introduce smallpox vaccination to its colonies in the Americas. The expedition involved transferring vaccine material from arm to arm using five Madrid orphans, ensuring its freshness during the voyage to the Caribbean (Franco-Paredes et al., 2005).

Governments have frequently invested in vaccines since Jenner's discovery, with varying levels of commitment. Initially, vaccines were seen as matters of national pride and prestige, later becoming essential to utilitarian concepts of societal security, productivity, and protection. Compulsory smallpox vaccination laws were enacted in Europe and North America during the 19th century (Hennoch, 1998; Jackson, 1969).

In the 20th century, vaccines played a vital role in combating major global health threats. Vaccines were developed for diseases like polio, measles, tetanus, and others (Hajj Hussein et al., 2015; Hinman et al., 2011). At the same time, a standard battery of childhood immunizations was developed, and vaccination became increasingly managed and regulated by government bodies at various levels, often becoming a requirement for public school attendance. This resulted in the saving of and reducing the prevalence of the above diseases, thanks to the continuous effort of vaccine development and improvement (Lobo, 2016; Seither, 2023). Advancements in vaccine technology continued over time. The introduction of new techniques, such as inactivated vaccines, attenuated vaccines, and other techniques, expanded the range of diseases that could be prevented through vaccination (Monto et al., 2009; Rodriguez-Calvo et al., 2010; Zheng, H. et al., 2011).

After the establishment of the World Health Organization (WHO) and related organizations such as UNICEF, vaccine programs expanded globally. In 1974, the WHO initiated the Expanded Program on Immunization (EPI) to significantly increase vaccination rates among children in developing countries (World Health Organization, 1984). For over three decades, the EPI has worked through WHO's regional offices to achieve target immunization rates for various diseases. WHO's notable success was the eradication of smallpox through a massive campaign in the 1960s and 1970s (Henderson, 1987). This achievement serves as an inspiration for ongoing immunization campaigns against diseases like polio and measles. Such campaigns, along with vaccine trials, have received support from global health organizations and major philanthropic

foundations such as the Rockefeller Foundation and the Bill and Melinda Gates Foundation (Nossal, 2000; Youde, 2013).

Paradoxically, as vaccines have become more prevalent, their significance has been somewhat diminished, particularly in the eyes of public funding agencies. The success of vaccines has led to complacency and a lack of adequate funding (Thompson et al., 2023).

The migration of vaccine production from government entities to commercial companies was expected to bring benefits such as competition, improved production, and lower costs. However, this expectation has not materialized. Many pharmaceutical companies avoid the vaccine business due to economic constraints and regulatory barriers. The concentration of vaccine manufacturing in a few companies also poses challenges. For example, in 1998, Pfizer (known then as Warner Lambert) stopped producing an influenza vaccine due to financial issues (Stern & Markel, 2005). King Pharmaceuticals, which acquired a key vaccine factory, later abandoned production because bringing the plant into compliance was deemed too costly. These factors contributed to the flu vaccine shortage in the United States in the fall of 2004 (Stern & Markel, 2005). A similar situation exists for basic childhood vaccines, with the majority manufactured by a single company (Douglas & Samant, 2018; Plotkin et al., 2017).

Pre-COVID-19 Coronaviruses Vaccine Research

COVID-19 is not the first coronavirus; there were two prior outbreaks, which are important to understand the challenges of developing the COVID-19 vaccine. Coronaviruses (CoVs) comprise a family of closely related viruses that can cause respiratory tract infections in humans, leading to a spectrum of symptoms ranging from mild to severe, including fatal outcomes. The first highly pathogenic coronavirus, known as SARS-CoV, emerged in Guangdong Province, China, in 2002. Between 2002 and 2004, the SARS-CoV outbreak (also known as just “SARS”) affected 8,098 individuals and resulted in 774 deaths worldwide. Following its initial emergence, the virus eventually disappeared (Li, Yen-Der et al., 2020). During the SARS outbreak in 2003, it took approximately 4 months for vaccine manufacturers to develop a range of effective antigens for animal testing and cell culture trials before the availability of the coronavirus genome sequence. The initial human trial of the SARS vaccine was conducted in Beijing in December

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2004, after the epidemic had already subsided. As a result, research efforts were halted at the preclinical stage, leaving no available vaccines against SARS-CoV (Abdolmaleki et al., 2022). Another coronavirus, MERS-CoV, was identified in Saudi Arabia in 2012. Subsequently, it caused outbreaks in South Korea in 2015 and Saudi Arabia in 2018, and sporadic cases continue to be reported. As of January 2020, there have been 2,519 confirmed cases of MERS, with 866 deaths reported across 27 countries, indicating a mortality rate of approximately 35% (Li, Yen-Der et al., 2020). It had even less vaccine development due to the scope of the outbreak. The absence of vaccines for SARS-CoV and MERS-CoV can potentially be attributed to inadequate funding and an incomplete understanding of the viruses' biology. These issues increased the challenges the COVID-19 vaccine manufacturers faced (Abdolmaleki et al., 2022).

Vaccine Development During COVID-19

Vaccines are widely regarded as one of the most remarkable advancements in modern medical history. (Li, Yen-Der et al., 2020). Therefore, in the early stages of the COVID-19 pandemic, it was clear that a vaccine would be needed to help fight the pandemic. Yet, as seen in the previous section, progress in coronavirus (CoVs) family vaccines was very limited. Additionally, the conventional process of vaccine development typically entails a protracted timeline of 15 years or more, commencing from the initial design phase to clinical investigations (Graham, 2020; Li, Yingzhu et al., 2021). Yet optimism was abundant among experts in the field, since “*new manufacturing platforms, structure-based antigen design, computational biology, protein engineering, and gene synthesis have provided the tools to now make vaccines with speed and precision.*” (Graham, 2020, p. 945). And indeed, the race was on to develop a COVID-19 vaccine by a multitude of companies with various approaches.

The development and assessment of vaccines are time-intensive endeavors, as scrupulous examination and surveillance are imperative to ensure the safe administration of any vaccine. Clinical trials for vaccines are often financially demanding, requiring the recruitment of large cohorts comprising individuals of diverse ethnicities, ages, and health conditions. Furthermore, comprehensive long-term monitoring is indispensable to ascertain vaccine effectiveness and to detect and address exceedingly rare safety concerns (Li, Yingzhu et al., 2021)

Within less than half a year of the first known case of COVID-19 in Wuhan, 40 organizations were researching potential vaccines from for-profit companies, universities, and state organizations. Already at such an early stage, there were three phase I vaccine candidates, 11 preclinical vaccine candidates, and 26 research-stage vaccine candidates (Wu, 2020). Vaccine development and testing are usually a long, sequential process beginning with an exploratory research stage, followed by basic laboratory work and computational modeling to identify promising antigens. The following step is pre-clinical testing in cell and animal models to establish safety and immunogenicity; successful candidates then proceed through human clinical trials. The clinical trials are composed of 3 phases: Phase 1, safety and dose-finding in small cohorts; Phase 2, expanded safety and immunogenicity across hundreds; and Phase 3, large-scale efficacy in thousands. After regulatory approval, large-scale manufacturing and post-marketing safety surveillance follow. The traditional timeline typically spans 10–15 years, with only the regulatory review often requiring an additional 1–2 years. During the COVID stages, the authorizations were combined, and authorizations were issued on an emergency basis, compressing the overall timeline (Li, Maochen et al., 2022; Sharma et al., 2020).

Just two years into the pandemic, data released by the World Health Organization (WHO) on March 28, 2022, showed that 153 vaccines are approved for clinical trials, with an additional 196 in preclinical trials. These vaccine candidates encompass various types, namely inactivated vaccines, live attenuated vaccines, viral vector vaccines, RNA vaccines, DNA vaccines, protein subunit vaccines, and VLP vaccines. More astonishingly what was conceived as impossible and should take many years happened in unexpected speed - a total of ten vaccines, three of which from India, have received WHO's approval for emergency use. These authorized vaccines encompass different categories, including inactivated vaccines, viral vector vaccines, mRNA vaccines, and protein subunit vaccines (Li, Maochen et al., 2022).

The expeditious progression of multiple COVID-19 vaccine candidates from initiation of clinical trials within a span of less than 6 months to conditional approval in just 10 months since the commencement of the COVID-19 pandemic represents an unparalleled achievement in the annals of vaccine development. The unprecedented expeditiousness observed in the development of COVID-19 vaccines is attributable to a confluence of multiple factors. These

factors include the expeditious dissemination of the viral genomic sequence, the availability of cutting-edge vaccine technologies, extensive collaboration within the global scientific community, substantial funding from various sources, and the pressing urgency stemming from the overwhelming demand for a solution. Such extraordinary achievements can be traced to cumulative effort spanning numerous decades of pioneering research, facilitated by the prompt sharing of critical information about the viral genome. Furthermore, the accelerated progress has been propelled by intensified cooperation among diverse research entities, encompassing academic institutions, pharmaceutical companies, and biotechnology firms. The endeavor has been fortified by enhanced governmental support, while the dedication of vaccine scientists, persistently laboring over the course of the early months of the pandemic, has served as an imperative driving force behind these notable accomplishments (Graham, 2020; Li, Maochen et al., 2022; Li, Yen-Der et al., 2020; Li, Yingzhu et al., 2021; Wu, 2020).

In response to the pandemic's onset, governmental agencies worldwide, nonprofit organizations, and numerous vaccine developers have marshalled substantial resources towards the endeavor of COVID-19 vaccine development. Notwithstanding the remarkable swiftness, safety protocols governing the development and approval processes of the currently accessible vaccines have adhered to established standards akin to those applied to prior vaccine candidates. Rigorous scrutiny of their clinical data has been conducted by governmental regulatory bodies and external review panels (Graham, 2020; Li, Maochen et al., 2022; Li, Yen-Der et al., 2020; Li, Yingzhu et al., 2021; Wu, 2020)

COVID-19 Vaccine Deployment

At the end of 2020, the knight in shining armor arrived in the form of COVID-19 vaccines, promising a foreseeable end to the terrible pandemic. The vaccines were developed by multiple companies, including AstraZeneca, Pfizer–BioNTech, Sputnik V, and many more. A year later, at the end of 2021, 7.9 billion vaccine doses had been administered globally (Dey et al., 2022).

Within 3 months of the initial rollout of the COVID-19 vaccine, the results were as promised. Research showed reduced hospital admission by 88%-91% after the first dosage (and 97% after

full vaccination) and reduced death rates (by 99%) due to the virus (Vasileiou et al., 2021; Zheng, C. et al., 2022).

A rapid rollout of the vaccine saved many lives. It is estimated that millions of people were saved thanks to COVID-19 vaccines, including at least 2-3 million just in the USA (Hotez et al., 2023). Yet the race was on to continue developing the vaccine to combat COVID-19 variants. This led to a “booster” vaccine shot being administered to provide resistance to the Omicron variant (Chenchula et al., 2022; Privor-Dumm et al., 2023).

High-income countries preordered most of the vaccines, leaving a vast majority of the world population with no feasible vaccination plan for the following two years (Nhamo et al., 2021; Su et al., 2021). Not only are high-income countries ahead with COVID-19 vaccines, but also vaccine manufacturing countries have managed to make the most of the pandemic (Evenett et al., 2021). Manufacturing countries that can impose an embargo on vaccine export and use vaccines for International Relations (IR) political gain, as part of Vaccine Diplomacy (Choi, 2021; Sharun & Dhama, 2021; Ullah et al., 2021). This was done with the purpose of increasing power and improving the Nation brand (Alexander, K. & Mazzucco, 2021; Alexandra Sarcinschi, 2020; Choi, 2021; Nhamo et al., 2021).

Chapter 2: Power

As can be seen in the examples at the end of the previous chapter, the manufacturing countries can impose an embargo on vaccine export and use vaccines with the purpose of improving the nation brand and increasing power (Alexander, K. & Mazzucco, 2021). Therefore, it is vital to better understand the concept of power before further investigating its role in COVID-19 vaccines. This section will briefly review the history of power, focusing on the modern concepts used in this paper.

The History of the Modern Concept of Power

This brief history outlines key milestones in modern thinking about power to highlight the tension between power as resources, power as relationships, and power as outcomes. It then introduces major IR conceptualizations that help translate the concept into empirical terms, including the role of capabilities, influence, and context. The section concludes by presenting the hard and soft power distinction as the framework that links to the discussion of soft power.

From the ancient Greek philosophers to the Enlightenment thinkers, various concepts of power have emerged, each offering unique insights into the nature and modes of exercise of power (Bailey, 2021; Wallach, 2014). While the specific concepts of power vary across different contexts, eras, and philosophers, the underlying concepts of influence, control, and authority remain central to its analysis. Contemporary scholars continued to debate and expand upon the concept of power. Some focus on the distribution of power in international relations, while others analyze power dynamics within organizations, communities, and social structures. The modern concept of power has become one of the most fundamental in the social sciences and a cornerstone of social theories such as Marxism, Feminism, Rational Choice, and many others.

The review of the modern concept of power starts with Hans Morgenthau in *Politics Among Nations*. (Morgenthau, 1948), as this is a pivotal moment in the research of power with Morgenthau attributed as the “*founding father of political realism*” and *Politics Among Nations* “*one of the canonical works of the discipline*” (Kunz, 2010, pp 189-190). Morgenthau made one

of the earliest attempts to define and conceptualize modern power. According to him, as a realist, politics, like society in general, is governed by objective laws rooted in human nature. In his view, all politics is a struggle for power, and power is control over others' minds and actions. The immediate aim of all state action is to obtain and to increase power. Since, by definition, all states seek to maximize their power, international politics can be conceived of and analyzed as a struggle between independent units seeking to dominate others (Guzzini, 2020; Holsti, 1964).

Robert A. Dahl in "The Concept of Power" (Dahl, 1957) adds onto Morgenthau's concept of power by providing a rigorous framework for understanding power relations. He defines power as the capacity of one actor to influence another's behavior, emphasizing the importance of the base of power, the means employed, the scope of the response, and the probability of achieving the desired outcome. While acknowledging the challenges of comparing power across different contexts, Dahl offers a conceptual foundation for analyzing power dynamics (Dahl, 1957).

Foucault reconceptualizes power as relational, rejecting the classical notion of power as a possession or instrument wielded by a sovereign authority (Miller, 1990). He challenges traditional ethical and political frameworks, rejecting notions of universal truth and moral absolutism (Christensen, 2024). Instead, for Foucault, power exists in the interactions and relationships among individuals, institutions, and social structures. It is not something individuals have; rather, it operates through them. Power is everywhere in Foucault's eyes. Modern power does not merely prohibit or suppress; it also enables and shapes reality, including desires, identities, and knowledge systems. (Christensen, 2024; Fraser, 1981; Miller, 1990).

Max Weber's concept of power is rooted in the relational and sociological nature of human interactions. According to Weber, power is defined as the ability of an individual or group to achieve their will despite resistance (Beetham, 1991; Green, 2008). Weber views politics as inherently tied to the struggle for power and the attempt to influence its distribution. His emphasis on the social dimensions of power resonates with Morgenthau's classical realist approach (Guzzini, 2020; Kunz, 2010; Morgenthau, 1948), yet unlike other realist approaches, Weber also views power as context-bound and relational (Dusza, 1989). Weber's perspective on power is distinct from static or purely resource-based views, as it incorporates elements of influence, resistance, and the sociocultural context in which power dynamics unfold. This

multidimensional understanding is foundational to the study of authority, rule (Herrschaft), and their manifestations in both domestic and international political structures (Beetham, 1991; Dusza, 1989; Green, 2008).

As the above review of the theoretical development of the concept of power shows, the key problem is that power in IR can be defined as the end or the means, and the most basic definition of power as the ability of one actor to force another actor to obey orders is not very useful in this regard (Aron, 1967). An initial definition that assists in transforming the concept for empirical research is that of Holsti (1964), who describes power as “*several aspects: it is a means, it is based on capabilities, it is a relationship, and a process, and it can also be a quantity*” (Holsti, 1964, p. 182). Weber’s definition of power, to achieve their will despite resistance (Beetham, 1991; Green, 2008), is developed by others to a more explicitly defined power as “*how one state uses its material resources to compel another state to do something it does not want to do*” (Barnett & Duvall, 2005, p. 40). This definition emphasizes the dynamic and contextual nature of power, while also pointing to the concept of material resources at its root (Beetham, 1991; Dusza, 1989; Green, 2008).

Modern concepts of power have also looked beyond concept definition to categorization of power, suggesting three separate types of power: Military power and economic power as two forms of hard power, compared to culture, values, religion, and education that are part of soft power (Nye, Joseph, 2005; Pallaver, 2011; wojciuk et al., 2015). Military power is an ancient power and the most fundamental one, the ability to coerce someone or a country by raw force (Baldwin, 2012; Nye, Joseph S., 2011). Economic power is a more complex power; it is harder to acquire and use, and especially to use successfully. Economic power can be used as a stick or a carrot, such as sanctions on goods or monetary support (Baldwin, 2012; Nye, Joseph S., 2011).

The Soft Power Concept

This section, while based on the development of the concept of power over the years, will narrow the focus to power within IR. No longer will internal power between the state and citizens be

used, yet concepts developed for that sphere of research provide a strong basis for understanding power.

Power in IR is easily understood as hard power. Military power as the classic example to force someone using raw force – the edge of a bayonet to obey your commands. Economic power, while more complex, is still relatively easy to grasp, since gifting assets and money or restricting access to goods and trade is commonly used and understood (Baldwin, 2012; Nye, Joseph S., 2011). But as seen in the conceptualization of power in human history, many philosophers had the notion that there is something about power that lies in the relationship between people, that is, beyond just resources or structures.

Yet only in the late 1980s was soft power introduced, offering a more subtle type of power (Baldwin, 2012; Pallaver, 2011). No longer are military spending and other classic measurements sufficient for estimating power. “*Population, territory, natural resources, economic strength, military force, and social stability*” (Nye, Joseph S., 2011, p. 12) as well as other aspects, have been examined to gain a more holistic understanding of what leads to power.

Soft power was initially suggested by Nye as a type of attraction, which is measured through subjective perceptions of a foreign country (Huang & Ding, 2006; Nye, Joseph S., 2004, 2008). Others suggested it should be reviewed as country reputation, nation brand, and national image, yet others claimed this is a completely standalone term (Yun Seong-Hun, 2018). There is significant debate over which other components should be included in this “catch-all” type of power. Among the suggested components are donations to other countries, membership in international organizations, the Olympics, TV channels, culture, and many more (Manzenreiter, 2010; Yavuzaslan & Cetin, 2016; Zamorano, 2016).

It is relatively easy to grasp and understand how states gain and use military power and economic power. Soft power, by contrast, is more evasive. The mechanisms behind the successful use of soft power are less researched and less obvious, which is one reason the notion and definition of soft power are so heavily contested (Fan, 2008; Vuving, 2009). To understand how soft power is used, looking at a similar form of power, namely Normative power, will provide some insight. The term normative power, initially conceived by Manners (Manners, 2002), is mostly used in research of the European Union (EU) to describe cooperation via institutions at the international,

regional, and inter-regional integration level, including formal and informal policy. This allows them to set standards, create norms and values that are desirable thanks to the way they were created, instead of by using hard power such as economic sticks and carrots (Roloff, 2020). The EU uses such normative power to influence states and intergovernmental organizations by the example of its internal cooperation, democratic ways, human rights, good governance, and solidarity (Langan, 2022; Manners, 2002; Pitty, 2022). Similar to how normative power is used and operates, so does soft power. Using the power of attraction, making core values (such as democracy) admirable, and spreading cultureⁱⁱ (Fan, 2008; Gallarotti, 2011; Nye, Joseph S., 2004). Yet soft power is also wielded in a more direct fashion – following the lead of the country using soft power and adhering to its wishes, due to the attraction and endearment that (Gallarotti, 2011; Kearn, 2011; Nye, Joseph S., 2004).

Other Types of Power Comparable to Soft Power

As seen in Manners' definition of Normative power, there are other types of non-hard power. Their definitions and distinctions can overlap and can vary depending on context and authors. Yet they serve to explain how non-hard power is defined, can help to better understand the mechanism of soft power, and serve as a reminder that while soft power is the most commonly used term for non-hard power, it is not the only one.

It is relatively straightforward to understand the concepts of hard power and soft power as distinct approaches to achieving the nation's objectives. Smart power, however, represents a more sophisticated strategy that combines these two types of power in a complementary and

ⁱⁱ This is based on how Nye's Soft power definition. Nye and Manners have different perspectives on normative power. Nye views normative power as a form of soft power, which he defines as the ability to attract and persuade others to follow one's lead. He argues that states can exercise normative power by appealing to the values and preferences of other states and by creating a positive image that attracts others to their ideas and values. In contrast, Manners conceptualizes normative power as a country's ability to influence the behavior of other states through the promotion of shared values and norms. In summary, Nye emphasizes the importance of attraction and persuasion in the exercise of normative power, while Manners focuses on the realization in practice of shared values and norms, through example setting (which is fundamental to Manners' approach).

context-sensitive manner (Gallarotti, 2015; Nye Jr, 2009). While soft power focuses on attraction and influence through non-coercive means, smart power integrates these elements with hard power aspects, such as military force or economic sanctions, to create a balanced and effective approach to gain IR goals (Gallarotti, 2015; Pallaver, 2011).

Soft power relies on intangible resources, and it seeks to influence behavior through admiration and the creation of shared interests, often encouraging other states to follow its lead or emulate its practices without the use of coercion (Gallarotti, 2015; Nye Jr, 2009; Nye, Joseph S., 2004; Pallaver, 2011). Smart power, on the other hand, works on the basis that attraction and influence alone may be insufficient in certain contexts and that the use of hard power, when strategically deployed, can complement and reinforce the effectiveness of soft power initiatives. For example, military interventions framed as humanitarian efforts or peacekeeping missions can enhance a nation's image while achieving specific security objectives. Similarly, economic assistance, when aligned with diplomatic goals, can simultaneously strengthen a nation's influence and build positive perceptions abroad (Gallarotti, 2015).

Soft power, as conceptualized by Joseph Nye, involves the ability to attract and co-opt rather than coerce, relying on cultural appeal, values, and policies (Nye, Joseph S., 2004, 2011; Roselle et al., 2014). However, soft power often lacks a clear framework for analyzing how these elements translate into influence (Roselle et al., 2014).

Narrative power addresses this gap by examining how narratives communicate and make sense of soft power resources, thereby enhancing their persuasive potential. Narrative power is both a complement to and an evolution of soft power. While soft power supplies resources (such as cultural values and political ideals), narrative power operationalizes these resources through storytelling mechanisms. Strategic narratives provide a structured approach to soft power by framing international events, policies, and relationships in ways that align with desired outcomes and foster shared understanding (Hagström & Gustafsson, 2019; Nicolaïdis & Howse, 2002; Roselle et al., 2014). In essence, narrative power acts as the communicative and ideological backbone of soft power (Nicolaïdis & Howse, 2002).

Ideational power is defined as the capacity of actors to influence others' normative and cognitive beliefs through the use of ideas (Carstensen & Schmidt, 2016; Curran et al., 2022). This influence

can occur directly, through persuasion or the imposition of certain ideas, or indirectly, by shaping the ideational context within which actors operate. Ideational power relates closely to the concept of soft power. Both concepts emphasize the role of ideas, norms, and discourses in shaping preferences and behaviors. However, while soft power focuses on the outcomes of influence, such as admiration for cultural, political, or ideological values, ideational power provides a more detailed theoretical framework for understanding the mechanisms and dynamics through which such influence is achieved (Carstensen & Schmidt, 2016; Curran et al., 2022). Therefore, while soft power captures the appeal and attraction of certain ideas or values, ideational power provides a broader and more nuanced account of how ideas operate as a form of power within discursive and institutional contexts (Carstensen & Schmidt, 2016; Curran et al., 2022).

Sharp power designates a distinctly authoritarian mode of influence that relies on censorship, secrecy, and coercive manipulation rather than persuasion. It is “sharp” because it is meant to pierce the political and information spaces of open societies, restricting free expression and altering the public sphere through disinformation campaigns, pressure on media outlets, and covert steering of academic or cultural institutions (Walker, 2018). Because it exploits the asymmetry between closed regimes and democratic openness, it flourishes most where democracies are porous, such as in journalism, publishing, universities, and the digital commons, corroding institutional integrity by masking state-directed initiatives as commercial or civic activity (Walker, 2018). Joseph Nye underscores that these operations are a form of hard power wielded through deception: from the KGB’s Cold-War dissemination of the AIDS rumor to more recent conspiracies such as “Pizzagate,” the objective is to narrow the autonomy of audiences, not to win their voluntary assent (Nye, Joseph, 2018).

The boundary between soft power and sharp power hinges on transparency. For example, when China’s Xinhua broadcasts abroad under its own name, it engages in soft power - but when China Radio International secretly finances foreign stations or when Confucius Institutes constrain debate on sensitive topics, the activity shifts to sharp power, because audiences are denied the information necessary for free consent (Nye, Joseph, 2018). Thus, while both approaches aim to shape preferences, soft power invites admiration through open narratives, whereas sharp power

subverts deliberation by manipulating the channels of discourse itself (Nye, Joseph, 2018; Walker, 2018). Nye warns that democracies must guard against the temptation to mimic authoritarian methods, because doing so would hinder the comparative advantage that originates from their own transparent civil societies (Nye, Joseph, 2018)

In examining soft power alongside related concepts of power such as normative power, narrative power, ideational power, and sharp power, it becomes self-evident that non-hard power dynamics are nuanced and multifaceted. These frameworks also expand understanding of soft power and its mechanisms. Yet this ambiguity and the challenges to understanding soft power mechanisms help us grasp its strengths, limitations, and potential pitfalls.

Criticism of Soft Power

The concept of soft power, while appealing in theory, faces significant criticisms and challenges that complicate its application and understanding. The criticisms revolve around its conceptual ambiguity, limited applicability, and difficulty in operationalization. Soft power lacks a precise and universally accepted definition, leading to confusion about its scope and content. The boundaries often blur, and the definition is overly inclusive and includes cultural exports, political values, and foreign policy, among other elements (Baumann, 2017; Blanchard & Lu, 2012; Curran et al., 2022; Fan, 2008; Ford, 2012; Hall, 2010; Kearn, 2011; Yukarıoğlu, 2017). Part of the challenge lies in distinguishing soft power from other forms of power, such as rational persuasion or cultural influence, which Nye includes but does not clearly distinguish (Baumann, 2017). This broadness and lack of conceptual clarity has led to its misuse in academic and policy contexts, reducing it to a catch-all term that encompasses a wide array of phenomena without providing precise analytical utility (Baumann, 2017; Blanchard & Lu, 2012; Curran et al., 2022; Fan, 2008; Ford, 2012; Hall, 2010; Kearn, 2011; Yukarıoğlu, 2017).

Measurement poses another critical challenge, which will be presented shortly and expanded later in this paper. Unlike hard power, which is tangible and quantifiable, soft power is inherently intangible and context-specific, making it difficult to assess. Indicators such as international student numbers or cultural exports are often used as proxies, but these measures fail to

distinguish between potential sources of soft power and their actual influence. The effectiveness of soft power is not inherent in its resources but depends on how these are perceived and received by target audiences, adding another layer of complexity to its evaluation (Baumann, 2017; Blanchard & Lu, 2012; Fan, 2008; Kearn, 2011; Kounalakis & Simonyi, 2011; Yukaruç, 2017). Complexity and the proliferation of non-state actors further exacerbate the challenges of employing soft power. The involvement of multinational corporations, NGOs, and transnational networks creates a dense and dynamic landscape, making it difficult to isolate the influence of soft power in shaping outcomes. This complexity imposes high informational burdens on analysts and policymakers, limiting the predictive and explanatory power of the concept (Kearn, 2011; Kounalakis & Simonyi, 2011; Yukaruç, 2017).

Part of the measurement challenges is who is measured and why? Nye's description of soft power emphasizes the agency of states, particularly the United States, as the primary wielders of this influence. However, this focus fails to account for the role of non-state actors and the broader structural forces that shape soft power dynamics. For example, while states may benefit from cultural exports like films or music, these are often produced by private entities beyond governmental control, complicating the attribution of soft power to specific state actors (Yukaruç, 2017).

Furthermore, the relationship between soft power and hard power reveals an inherent dependency that challenges the notion of their independence. Soft power researchers argue for its potential to complement hard power; the extent to which hard power resources (e.g., military or economic strength) underpin soft power remains ambiguous. While soft power is often praised for its ability to attract and co-opt, it frequently requires hard power resources to be effectively operationalized. For example, cultural assets may serve as potential sources of influence, but their impact is contingent on the presence of robust economic and political structures that enable their promotion and dissemination. Critics also note that material success and tangible capabilities often bolster a state's attractiveness, blurring the lines between coercion, inducement, and genuine attraction. This dependency suggests that soft power cannot function effectively in isolation, limiting its utility as a standalone tool of influence (Baumann, 2017; Fan, 2008; Kearn, 2011).

Another significant challenge lies in the unpredictable nature of soft power. The dialectical nature of soft power, where attraction can breed both affinity and resistance. This underscores the risks associated with overextending soft power without regard for its potential to provoke unintended negative consequences (Fan, 2008; Kearn, 2011). And unlike the immediate and tangible effects of hard power, the impact of soft power is often delayed and indirect, making it difficult to predict and control. This limits its utility in achieving short-term objectives, which are often the focus of state-level decision-making (Baumann, 2017; Fan, 2008; Kearn, 2011). Finally, the ethnocentric foundation of soft power is also worth noting, particularly Nye's focus on Western values and culture. There is a need for a more culturally sensitive and contextually aware approach to understanding and wielding soft power (Bilgin & Eliş, 2008; Fan, 2008; Ford, 2012).

These critiques collectively illustrate the challenges of conceptualizing, measuring, and leveraging soft power. This, while soft power provides a compelling framework for understanding non-coercive influence, its conceptual vagueness, dependency on hard power, and contextual variability significantly constrain its applicability. These challenges highlight the need for a more nuanced approach that seeks to establish more specific mechanisms that reflect the pathways through which influence operates in international relations (Hall, 2010).

Chapter 3: Soft Power at the Time of Crisis

Medical Donations - Global Health Diplomacy (GHD)

The section examines medical diplomacy, also known as Global Health Diplomacy (GHD), as a field that brings together public health and foreign policy to tackle shared challenges such as pandemics, vaccine distribution, and health infrastructure. By showcasing historical and contemporary examples, from Soviet support for smallpox eradication to the US AIDS Relief plan (PEPFAR), this section illustrates both the humanitarian potential and strategic dimensions of health diplomacy. It highlights the interplay of soft, hard, and smart power, as well as the roles of diverse actors from states, NGOs, and international organizations, in negotiating outcomes that balance ethical imperatives with national interests.

What is Global Health Diplomacy?

Medical diplomacy, or health diplomacy, often referred to as Global Health Diplomacy, is the strategic use of health initiatives within the broader framework of international relations and foreign policy. It underscores the growing recognition of health as a fundamental component of global stability and security, addressing pressing global health challenges through cooperative international frameworks, partnerships, and negotiations. Health diplomacy involves a diverse range of actors and activities, including formal negotiations between countries, collaborations involving governmental and non-governmental entities, and health-focused actions undertaken by one country in another. This interdisciplinary concept intersects health with areas such as trade, intellectual property, and education, fostering collaboration between nations and stakeholders in pursuit of shared health objectives while advancing foreign policy goals (Adams et al., 2008; Hotez, 2014; Katz et al., 2011; Labonté & Gagnon, 2010; Michaud & Kates, 2013; Ruckert et al., 2016).

The origins of medical diplomacy date back to the late 20th century, with Peter Bourne in 1978 as one of its key pioneers (Bourne, 1978). He proposed that health could serve as a bridge to overcome traditional diplomatic barriers, emphasizing the humanitarian and universal nature of

health issues. Over time, the concept evolved into Global Health Diplomacy, which now signifies a multi-faceted approach that integrates technical expertise, legal frameworks, and diplomatic skills to address health-related challenges that transcend borders (Adams et al., 2008; Bourne, 1978; Katz et al., 2011; Labonté & Gagnon, 2010).

Global Health Diplomacy operates across several dimensions, including core diplomacy, multistakeholder diplomacy, and informal diplomacy. Core diplomacy involves formal negotiations between states, such as those resulting in treaties like the WHO Framework Convention on Tobacco Control or the International Health Regulations (Lee, K. et al., 2010). These agreements often demand a high level of technical and diplomatic acumen, balancing sovereign interests with collective global health goals (Hotez, 2014; Katz et al., 2011; Labonté & Gagnon, 2010).

Non-state actors, such as foundations, NGOs, and private sector entities, play a critical role in this sphere, demonstrating a shift from traditional state-centered diplomacy to a networked, multi-actor approach. For instance, partnerships like the Global Fund to Fight AIDS, Tuberculosis, and Malaria exemplify how collaborative frameworks can mobilize resources and coordinate actions to address complex health crises. (Adams et al., 2008; Hotez, 2014; Katz et al., 2011; Labonté & Gagnon, 2010; Michaud & Kates, 2013; Ruckert et al., 2016). The literature highlights three levels of analysis central to understanding health diplomacy: the global/international, domestic/national, and individual levels. Each level provides insights into the motivations and mechanisms underlying health-related foreign policy initiatives. At the global level, systemic forces such as power distribution, international norms, and the role of transnational actors influence health diplomacy outcomes. The national level emphasizes the impact of domestic political structures, interest groups, and advocacy networks, while the individual level considers the contributions of political leaders, celebrity activists, and policy entrepreneurs in shaping health diplomacy agendas (Ruckert et al., 2016).

Health diplomacy is characterized by its dual purpose: it serves both as a mechanism for improving global health outcomes and as a tool for advancing foreign policy goals. For proponents of global health, diplomacy is seen as an opportunity to secure attention, resources, and policy support for health initiatives. Conversely, for foreign policy practitioners, health

programs are often a means of exercising soft power and fostering international goodwill, sometimes driven by a sense of enlightened self-interest. These differing motivations can align but may also conflict, as evidenced by tensions between global health equity and national security priorities (Labonté & Gagnon, 2010; Michaud & Kates, 2013).

The integration of health into foreign policy strategies reflects its growing importance in addressing global interdependencies. Initiatives such as the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) demonstrate how health diplomacy can advance both health and foreign policy goals, including stability, economic growth, and improved international relations. However, this growing emphasis on health diplomacy also underscores the need for specialized training and cross-disciplinary expertise to effectively bridge the gaps between health, law, and international relations (Katz et al., 2011).

Yet global health diplomacy as an evolving field is lacking clear definitional and theoretical grounding. While multiple terms like "health diplomacy" and "medical diplomacy" are used interchangeably, with sub-set terms also in use, such as "vaccine diplomacy". The fragmented and often under-theorized nature of Global health diplomacy scholarship requires a greater integration of IR theories, such as realism, constructivism, and liberalism, to better explain the dynamics of health diplomacy. There is still a need for research that will focus on understanding the dominant forces and conditions driving Global health diplomacy at different levels and emphasize the role of power in shaping outcomes (Ruckert et al., 2016).

Health diplomacy is a dynamic and essential component of contemporary global governance. It not only addresses pressing health challenges but also contributes to broader diplomatic and security objectives, making it a vital tool for fostering international collaboration in an increasingly interconnected world. Therefore, Global health diplomacy represents a vital intersection of health and diplomacy, with the potential to create mutual benefits for global health and foreign policy. Ultimately, health diplomacy aspires to cultivate a cadre of professionals equipped with the knowledge and skills to navigate the complexities of global health governance. By fostering collaboration across disciplines, it aims to address the interconnected challenges of health and international relations, ensuring that global health initiatives are inclusive, ethical, and effective. This field, therefore, not only addresses

immediate health needs but also contributes to long-term peace and stability by building bridges across nations through the shared goal of human well-being. (Adams et al., 2008; Katz et al., 2011; Michaud & Kates, 2013).

Health Diplomacy as a Component of Soft Power

Before turning to health diplomacy, it is useful to note that soft diplomacy is practiced across several additional domains in which influence is pursued through cooperation, exchange, and credibility rather than coercion. Science diplomacy is a concept that explicitly seeks to interconnect the spheres of science, politics, and international affairs, and frames it as a bridge-building approach that becomes particularly noticeable where global challenges require transnational collaboration and where scientific and technological knowledge is treated as crucial for policy-making across borders (Flink & Rüffin, 2019). Culture such as libraries, museums, and cultural centers are presented as long-standing foreign-policy platforms and instruments of cultural diplomacy that function as “cultural ambassadors,” facilitating the exchange of ideas, culture, and knowledge, while enabling foreign policy to influence attitudes by communicating identities, ideas, and values to foreign publics and building bilateral and multilateral relationships (Mariano & Vårheim, 2022). In environment and climate, cooperation is similarly institutionalized through multilateral governance frameworks that address climate change and related technology transfers, including commitments under the UNFCCC and subsequent mechanisms that support technological cooperation and knowledge sharing, with growing attention to pathways that extend beyond traditional North–South transfers (Bry, 2014). Health diplomacy, which was recognized in the 2007 Oslo Ministerial Declaration as the linkage between health and foreign policy (Hotez, 2014), differs from hard forms of diplomacy, which often focus on elements like military force or economic dominance. Instead, it operates at the intersection of public health, international relations, and global governance, emphasizing cooperative solutions to issues that transcend national boundaries. Countries use health programs to enhance their global standing, foster alliances, and achieve foreign policy objectives. Historical examples include the United States’ PEPFAR program and China’s extensive medical support in Africa. Other examples include health diplomacy as part of

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negotiating international agreements, such as the Framework Convention on Tobacco Control, which leverage collective action to address health concerns on a global scale (Hotez, 2014; Kickbusch et al., 2007; Kickbusch, 2011; Lee, K. et al., 2010; Michaud & Kates, 2013). Therefore, as seen in the previous section, Health diplomacy is usually characterized as a form of soft power. This is due to its reliance on negotiation, collaboration, and multi-actor engagement to address complex global health issues (Hotez, 2014; Kickbusch et al., 2007; Kickbusch, 2011; Michaud & Kates, 2013). While such initiatives may align with broader geopolitical goals, they also yield tangible health benefits, illustrating the potential for synergistic outcomes (Kickbusch, 2011).

Yet there is no consensus that Health diplomacy is always an aspect of soft power. Many scholars have pointed out that Health diplomacy can be used as a form of Smart power. Health diplomacy seen through the lens of Smart power emphasizes the integration of persuasion, capacity building, and the projection of influence through health initiatives. This Health diplomacy is used to address critical issues such as international security, stability, and economic development, while simultaneously serving humanitarian purposes. This combines traditional hard power tactics and soft power (Kevany, 2014; McInnes & Rushton, 2014). Since Health diplomacy does not only engage diplomats but also requires collaboration with diverse stakeholders, including non-governmental organizations, scientists, activists, and the private sector. This multi-level and multi-actor approach also reflects an understanding that health, traditionally viewed as a "soft" issue, can have significant "hard" ramifications, such as economic impacts or security threats (Kickbusch, 2011; McInnes & Rushton, 2014).

Good examples of Health diplomacy serving this dual aspect of powers are the US interventions in Iraq and Afghanistan. In these cases, health diplomacy was used not only for humanitarian purposes but also as a component of broader counterinsurgency strategies. It sought to stabilize conflict zones, build local and national goodwill, and enhance the legitimacy of host governments. Health initiatives such as vaccination programs, medical services, and health infrastructure development were integrated into military and political agendas. These efforts were underpinned by the belief that improving health outcomes could promote stability, reduce extremism, and foster positive perceptions of the US and its allies. These health initiatives were

often carried out by military personnel, became a formal component of US military operations as core military missions on par with combat operations, and were used to fund small-scale, quick-impact projects intended to gain the trust of local populations. These elements illustrate how Health diplomacy, while ostensibly a form of soft power, incorporates distinct aspects of hard power through its reliance on military assets, integration into coercive strategies, and alignment with security objectives. This fusion of hard and soft power reflects how Health diplomacy can be a sort of smart power (McInnes & Rushton, 2014).

Additional Examples of Previous Medical Donations

The previous section expanded on the concept of Global Health Diplomacy and the correct theoretical power framework. Yet remaining at the theoretical level is inadequate for this thesis, which examines a real-world case. Therefore, this section will review key examples of Global health diplomacy from the past century to provide a basis for understanding the foundation on which previous power measurements were formulated and analyzed. This section will not be an exhaustive list but rather one that uses various examples to highlight a wide array of aspects of global health diplomacy.

When looking at non-emergency donations that lay the foundation for health development, a good example is China's health donations. This includes China's early efforts in the 1960s, such as its response to Algeria's request for assistance in rebuilding its medical system. This also includes China's malaria eradication campaign in Comoros from 2007 to 2014, which used artemisinin-based compounds to control the disease effectively (Killeen et al., 2018). Another notable example of health donations is the Soviet Union's contribution to smallpox eradication efforts. Between 1962 and 1966, the USSR provided 450 million doses of smallpox vaccine to support global eradication campaigns, while the United States supplied key financial backing. This collaborative effort played a crucial role in the eventual global eradication of smallpox by the late 1970s (Hotez, 2014). Similarly, the Indo-US Vaccine Action Program (VAP), launched in the 1980s, facilitated knowledge transfer and technological support between India and the United States to advance vaccine development for infectious diseases affecting both regions (Hotez, 2014).

One of the earliest and significant examples of health donations is the establishment of a smallpox vaccine stockpile following the eradication of smallpox in 1980. Member states of the WHO contributed vaccines to this stockpile, which remains under WHO management. The stockpile was developed to mitigate potential outbreaks due to bioterrorism or accidental releases of the virus. Although millions of doses have been maintained in storage, no doses have been deployed since their inception (Yen et al., 2015). Other noticeable stockpile initiatives include the meningococcal vaccine stockpile, established in 1997 by the International Coordinating Group (ICG) on Vaccine Provision for Epidemic Meningitis Control. The yellow fever vaccine stockpile, initiated in 2001, was similarly established with donor funding. The oral cholera vaccine stockpile, established in 2013, was created to combat cholera outbreaks in emergency situations. This stockpile, managed by the ICG, follows the same funding and governance model as the yellow fever and meningococcal vaccine stockpiles (Yen et al., 2015). In the 21st century, the GAVI Alliance emerged as a central player in global health donations. Established in 2000, GAVI has been instrumental in providing vaccines to developing nations, including North Korea, which otherwise faced significant barriers to accessing immunization programs. This initiative was critical in ensuring equitable vaccine distribution and improving child mortality rates (Hotez, 2014).

A key example of a response to a specific crisis is the donations made as part of the global response to the H5N1 (bird flu, Avian Influenza) and H1N1 2009 influenza outbreaks. Developed and high-income countries, leveraging their economic and technological advantages, were able to secure large advance purchase agreements with vaccine manufacturers, effectively monopolizing the supply chain. This left limited availability for developing countries, which lacked the financial and logistical capacity to compete and therefore depended on donations from developed countries (Bell et al., 2012; Fidler, 2010; Hotez, 2014; Turner, 2016). For the 2009 H1N1 pandemic, developed countries and vaccine manufacturers made several pledges to donate vaccines and other essential supplies to assist developing nations. The primary instrument for these donations was the WHO's Vaccine Deployment Initiative (VDI), which managed and coordinated the distribution of donated vaccines and other critical resources. The United States initially committed to donating 10% of its vaccine stockpile to the WHO. Australia, Brazil,

France, Italy, New Zealand, Norway, Switzerland, and the United Kingdom, along with several other developed nations, also responded by pledging nearly 120 million vaccine doses to the WHO for redistribution to developing countries. Similarly, manufacturers such as Sanofi-Aventis pledged vaccine donations to the global health community. However, only 12.3% of the total vaccines deployed internationally were donated, underscoring the overwhelming reliance on self-procurement during the pandemic. Despite this relatively low percentage, donated vaccines were essential in regions such as Africa, where they accounted for 94.5% of the total vaccine supply, and South-East Asia, where they accounted for 91.2% (Bell et al., 2012; Fidler, 2010; Turner, 2016). The reliance on the goodwill of developed countries and pharmaceutical companies proved problematic, as donations often arrived too late to be maximally effective. By the time many donated vaccines reached recipient countries, the pandemic had entered a phase in which the virus behaved more like a seasonal influenza strain than an emergent pandemic threat (Bell et al., 2012; Fidler, 2010; Turner, 2016). Donor states translated their H1N1 contributions into influence by converting health resources (vaccines) into reputational and political returns through medical diplomacy. Providing vaccines (and other essential supplies) during a global emergency generated goodwill and improved perceptions of donors as competent, responsible, and solidaristic actors, strengthening their political legitimacy in the eyes of foreign publics and decision-makers. That legitimacy and goodwill then functioned as diplomatic capital: it eased acceptance of the donor as a partner, expanded access to cooperative relationships, and reinforced the donor's ability to shape agendas and narratives in global health governance (Donahue et al., 2010).

The global response to the influenza health issue in 2012 was a repeat. Developed countries had well-established influenza vaccination programs, and only a small fraction of influenza vaccine production was allocated to developing countries. The Partnership for International Vaccine Initiatives (PIVI) was formed in response to this inequity to catalyze vaccine introduction in resource-limited settings through initial donations and sustained technical support. The initiative aligns with the WHO's global efforts to increase influenza vaccine coverage and strengthen pandemic preparedness. Between 2013 and 2018, PIVI facilitated the donation of influenza vaccines to eight developing countries. Over this period, over 3 million

doses of influenza vaccine were donated by pharmaceutical companies, international health organizations (such as UNICEF), government agencies (such as the US CDC), and NGOs (such as the Bill & Melinda Gates Foundation) (Bresee et al., 2019).

Another central initiative was The Global Fund to Fight AIDS, Tuberculosis, and Malaria, established with the support of G8 governments, and played a central role in mobilizing resources for these efforts (Hotez, 2006). The United States played a critical role through the President's Emergency Plan for AIDS Relief (PEPFAR) and other global health (Hotez, 2006). Brazil actively engaged in the direct transfer of knowledge, expertise, and technical assistance. Through the Center for Technical Cooperation on HIV/AIDS (CICT), Brazil sent teams of doctors and pharmaceutical experts to train healthcare officials in countries such as Mozambique, Nigeria, and Angola (Lee, K. & Gomez, 2011).

In conclusion, these historical and contemporary examples illustrate that Global Health Diplomacy, practiced for over a century, has never been the purview of a single actor or approach. Instead, it comprises a multifaceted network of governmental entities, philanthropic organizations, non-governmental agencies, international institutions, and private manufacturers. From early bilateral medical assistance programs (e.g., China's efforts in Algeria) and Cold War-era vaccination campaigns (e.g., Soviet smallpox eradication contributions) to modern multilateral mechanisms (e.g., the GAVI Alliance, the Global Fund, and PIVI), global health diplomacy has steadily evolved in response to shifting disease burdens, technological advances, and geopolitical realignments. Equally critical is the interplay of power and responsibility as wealthier nations, international organizations, and pharmaceutical companies negotiate donations, supply chains, and technical support to resource-limited settings. Vaccine donations are therefore not only humanitarian interventions, but also diplomatic instruments used to signal leadership and solidarity, strengthen relationships, and build international reputation. When visible and timely, such contributions can generate soft-power benefits through goodwill and credibility as a provider of global public goods. These examples underscore not only the promise of collaborative engagements but also the persistent challenges of achieving timely, equitable access to healthcare and vaccines. Collectively, they highlight how Global Health Diplomacy,

rooted in cooperation and shaped by intersecting political, economic, and public health interests, serves as a vital, yet complex, mechanism for improving global health security.

COVID-19 Vaccine Diplomacy

Shortage of COVID-19 Vaccines

The spread of COVID-19 triggered a worldwide health crisis in which COVID-19 vaccines became what was perceived as the knight in shining armor for mitigating the spread of the pandemic and reducing severe disease outcomes. Yet, from the early months of distribution, many nations encountered major vaccine shortages. The reasons for these shortages were multiple and interrelated. At the base of the shortage was constraints on global vaccine production capacity. Even though multiple COVID-19 vaccines were approved with remarkable speed, manufacturers remained cautious during the research phase. Vaccine producers typically waited for substantial evidence of safety and efficacy before scaling up, even when backed by well-funded development programs like Operation Warp Speed, a program to accelerate the development, production, and administration of COVID-19 via public-private partnership, in the United States (Burgos et al., 2021; Castillo et al., 2021). Although certain companies did take risks by investing in large-scale production lines before clinical trial data were finalized, those early investments proved insufficient to meet the unprecedented and immediate global demand once authorizations were granted (Burgos et al., 2021; Castillo et al., 2021).

In the face of this shortfall, a major acceleration in production proved logistically challenging, especially with novel vaccine methods such as mRNA. These new technologies relied on delicate processes, specialized production equipment, and skilled technicians, all of which created bottlenecks that were not easily resolved (Castillo et al., 2021; Gereffi et al., 2022). Another complicating factor was the rapid emergence of variants, including Omicron, which motivated manufacturers to adjust production pipelines for booster doses. This imperative placed additional burdens on supply chains, pushing back timelines for initial dose production and distribution. Although such research was necessary to maintain vaccine efficacy against

emerging mutations, it did not help close the supply gap for countries awaiting core vaccine consignments (Liu & Lou, 2022).

Alongside production constraints, storage and distribution had their own obstacles, with a key challenge being the requirement of a cold chain for some vaccines. The Pfizer-BioNTech vaccine was often cited as a key example, requiring storage temperatures near -70°C (Burgos et al., 2021). Maintaining these extreme temperatures from the point of manufacture through transportation, warehousing, and final administration sites required logistics and infrastructure that are not widely accessible in many parts of the world. High-income countries (HICs) found it easier to invest in specialized freezers and advanced cold-chain networks, whereas lower- and middle-income countries (LMICs) faced more limited capacity for ultra-cold transport and long-term storage (Castillo et al., 2021; Mohseni Afshar et al., 2022).

Global vaccine shortages were further exacerbated by the concept often referred to as “Vaccine Nationalism”. This term describes how high-income countries secured substantial quantities of doses, in many cases before official approvals were even granted. Several sources detail how governments like those of the United States and the United Kingdom entered into Advance Purchase Agreements (APAs) with developers such as Pfizer-BioNTech, Moderna, Johnson & Johnson, and AstraZeneca (Md Khairi et al., 2022; Nhamo et al., 2021; Pilkington et al., 2022). By doing so, these nations ensured that domestic needs would be met first, with some countries accumulating enough doses to vaccinate their entire populations multiple times over. Although these strategies guaranteed access for wealthier nations, they diminished the pool of available vaccines for countries without the financial resources or bargaining power to negotiate similarly large or swift contracts. In this environment, LMICs were often left at the back of the queue, forced to accept delayed deliveries or limited consignment sizes even as the pandemic ravaged their populations (Md Khairi et al., 2022; Nhamo et al., 2021; Pilkington et al., 2022).

HICs, which represent a relatively small portion of the global population, collectively purchased over half of all available vaccine doses early in the pandemic (Binagwaho et al., 2021a; Forman et al., 2021). Some governments, including Canada and the United Kingdom, accumulated multiple doses per resident. Meanwhile, countries such as Congo, South Sudan, Nigeria, Yemen, and Burundi struggled to secure enough doses to cover even a small fraction of their vulnerable

populations (Mohseni Afshar et al., 2022). Over the first few months of distribution, HICs raced to achieve coverage rates that quickly surpassed 50% or more of their populations, with some going on to offer booster programs while poorer regions were still awaiting initial shipments (Liu & Lou, 2022; Pilkington et al., 2022).

At the heart of this situation lay basic economic challenges of scarce resources, which led to a supply and demand conundrumⁱⁱⁱ. HICs, such as countries of North America and Western Europe, had the advantage of negotiating directly with pharmaceutical companies, guaranteeing a supply for domestic rollout. In contrast, LMICs lacked the funds to commit to early deals or to invest in large deposits for vaccines still in clinical trials. To make matters more difficult, LMICs that tried to purchase vaccines often had to pay higher prices per dose compared to wealthy nations that had secured bulk deals. This pricing discrepancy created additional inequalities, where those with the least resources bore the highest per-unit costs (Burgos et al., 2021; Forman et al., 2021).

Similar disruptions occurred because some nations implemented export controls on key raw materials and supplies essential for vaccine production. The United States (US), for example, restricted exports of certain components during the height of COVID-19 in the US (Gereffi et al., 2022; Zarocostas, 2021). Another factor that prolonged shortages involved intellectual property restrictions and limited knowledge transfer. Several pharmaceutical companies were reluctant to share proprietary manufacturing information, citing concerns about quality control, liability, and profit structures (Pilkington et al., 2022; Zarocostas, 2021). Although more than 280 voluntary partnerships emerged during this period, experts like Zarocostas (2021) contend that they remained insufficient to address the shortfall. A proposed waiver of certain intellectual property protections at the World Trade Organization (WTO) garnered support from some nations, such as India, South Africa, and, later, the United States, for discussions specific to vaccines, but other

ⁱⁱⁱ It is important to note that some of the scarcity was due to the lack of intellectual property sharing by vaccine manufacturers (Zarocostas, 2021). Therefore, part of the shortage is artificial rather than stemming from an actual lack of resources or manufacturing capabilities.

vaccine-producing countries worried about the long-term ramifications of weakening patent rights (Zarocostas, 2021).

While many LMICs struggled to access any vaccine doses at all, distribution in wealthier nations was comparatively swift and broad-based. As soon as the earliest doses arrived, large-scale vaccination campaigns were rolled out in HICs across North America and Europe, quickly targeting older adults, healthcare workers, and other high-risk groups (Forman et al., 2021). Many countries expanded eligibility within a few months to the general adult population, eventually extending coverage to minors and even adding a booster shot. This discrepancy in the pace of administration was evident in the data. By early 2021, an overwhelming majority of administered doses were located in high-income regions, while major parts of the developing world remained essentially unprotected (Liu & Lou, 2022; Pilkington et al., 2022).

Such glaring disparities and the discarding of doses in high-income settings while dire shortages persisted elsewhere were the cause of ethical debates (Pilkington et al., 2022). The US, for instance, reportedly discarded millions of doses over a span of several months (Pilkington et al., 2022). Those doses might otherwise have contributed substantially to immunization drives in impoverished regions. Wastage also occurred in Europe as countries raced to procure supplies large enough to cover worst-case scenario planning, only to find that some stocks expired before they could be administered. Efforts by the EU to coordinate among member states somewhat mitigated these issues, employing equity constraints in mathematical models aimed at ensuring a more balanced allocation (Khodaei et al., 2022).

Central to understanding the vaccine shortages is recognizing that a small set of countries was responsible for most global vaccine production. The six major producers, China, Germany, India, Russia, the United Kingdom, and the US, were the engines behind the vast majority of manufactured doses (Gereffi et al., 2022). These countries often preserved domestic stockpiles before agreeing to commercial exports or international donations. China, for instance, ramped up its vaccine production rapidly, exporting to Africa, South America, and Asia, though primarily through bilateral deals. The US, by contrast, initially focused on fulfilling domestic needs under Operation Warp Speed funding arrangements (Nhamo et al., 2021). Some countries did donate to smaller nations, but typically after reaching advanced coverage rates on their own

soil. These dynamics reflected a “vaccine club,” wherein manufacturing nations retained strong control over supply and distribution (Gereffi et al., 2022; Zarocostas, 2021).

The broader economic and societal repercussions of limited vaccine availability for LMICs have been widely discussed. When vaccination rates remain low, governments cannot safely relax public health measures, thus prolonging lockdowns or movement restrictions (Asundi et al., 2021; Castillo et al., 2021). Delayed recovery in these regions affects the global economy, since international trade and travel are intertwined worldwide. This interconnectedness suggests that wealthier nations benefit from global vaccination progress because unvaccinated populations may serve as incubators for new variants capable of breaching international borders. Nonetheless, short-term national interests often outweighed cooperative considerations, which is why the pandemic inflicted greater and more prolonged harm on regions that could not secure sufficient COVID-19 vaccines in a timely manner (Asundi et al., 2021; Castillo et al., 2021).

Ultimately, those who benefited from scarce supplies were HICs that received a majority of early doses and achieved comparatively high immunization levels faster (Binagwaho et al., 2021a; Pilkington et al., 2022). LMICs that lacked financial resources or were burdened by political instability or conflict lagged behind. Many had not reached meaningful coverage even when HICs began considering additional booster doses to combat waning immunity or new variants. This reality persisted through 2021 and 2022, despite calls by global authorities to improve vaccine equity (Liu & Lou, 2022).

Although international attention on COVID-19 vaccine inequities eventually prompted some wealthier nations to donate doses and lighten export restrictions, many shipments arrived too late or in forms that were difficult to use. Some donated batches had too little remaining shelf life to be distributed effectively, a fact repeatedly underscored by governments in sub-Saharan Africa and South Asia (Pilkington et al., 2022). Logistical challenges around final-mile delivery in remote or rural areas were no less daunting. Without a stable schedule, countries struggled to train vaccination teams and set up sites that conformed to the cold-chain specifications (Tagoe et al., 2021).

The COVID-19 vaccine inequities sparked discussions about potential policy changes for future pandemics. Numerous experts suggested that, beyond intellectual property waivers, a robust

system of technology transfer is necessary so that multiple regions can promptly pivot to manufacturing vaccines when a global crisis strikes (Gereffi et al., 2022; Pilkington et al., 2022). Others pointed out that some philanthropic or partial licensing models had succeeded for older vaccines or for treatments targeting diseases that predominantly affect developing regions. In the case of COVID-19, volunteer licensing arrangements, like that between AstraZeneca and the Serum Institute of India, did improve short-term capacity for certain vaccines, yet the approach did not scale to incorporate all major vaccine platforms (Asundi et al., 2021; Binagwaho et al., 2021a).

In the end, the shortage of COVID-19 vaccines was not attributable to any single actor or moment. Rather, it was the product of multiple factors: manufacturers reluctant to invest heavily in pre-approval, supply chain problems from raw materials to packaging, the formidable constraints of cold-chain logistics, and the strong impetus among wealthy nations to guarantee domestic access first. This tight-knit interplay of production and political interests aggravated existing inequities, giving an early and sustained advantage to HICs. At the same time, LMICs were forced to cope with intermittent or delayed supplies and often lacked the infrastructure to quickly deploy whatever doses did arrive. Yet many of the structural inequalities that shaped vaccine distribution during COVID-19, such as poor healthcare infrastructure, limited financial flexibility, and intellectual property barriers, are not unique to this pandemic (Acharya et al., 2021; Burgos et al., 2021; Tagoe et al., 2021).

As the pandemic progressed, boosters and variant-specific formulations introduced a new layer of competition for vaccine supplies (Liu & Lou, 2022). The demand from wealthier nations for updated booster doses often outstripped what manufacturers could produce quickly, leaving fewer doses for populations that were still unprotected. Ethical concerns continue to reverberate. Some HICs found themselves discarding millions more expired doses as consumer enthusiasm or logistical readiness declined, while in other parts of the world, even healthcare workers had not received a primary dose (Mohseni Afshar et al., 2022; Pilkington et al., 2022). Consequently, the people who received vaccines early and in sufficient quantities largely lived in HICs, where governments had secured supplies, financed massive distribution efforts, and provided advanced medical infrastructure (Pilkington et al., 2022; Castillo et al., 2021). Those in low-income

countries, or in marginalized communities even within middle-income nations, tended to wait longer. Many were also hindered by logistical constraints. The challenges at the root of the COVID-19 vaccine shortage reflect shortcomings in global health equity that persist well beyond the COVID-19 crisis (Acharya et al., 2021; Asundi et al., 2021; Gereffi et al., 2022; Liu & Lou, 2022; Tagoe et al., 2021).

Multi-national Organizations Orchestration of Donations

Against this backdrop, stakeholders across the international community sought ways to address the shortfall. The COVID-19 Vaccines Global Access (COVAX), co-led by the WHO, Gavi (the Vaccine Alliance), and the Coalition for Epidemic Preparedness Innovations (CEPI), emerged as the most prominent multilateral initiative. Its mission was to pool funds from various donors, mostly national governments, philanthropic organizations, and private entities, so that vaccine doses could be secured and distributed more fairly across countries with different income levels (Binagwaho et al., 2021a, 2021b; Burgos et al., 2021; Md Khairi et al., 2022). In response, multilateral and bilateral efforts attempted to rebalance vaccine flows, albeit with mixed success. COVAX remained the largest coordinated mechanism, pooling contributions from governments and philanthropic bodies with the aim of securing as many doses as possible for lower-resource settings (Burgos et al., 2021). While COVAX was the largest, it polled together the most donor nations and receiving nations, and received the most publicity, but it was not the only program. As COVAX supply channels fell short, African states and the Africa Centres for Disease Control and Prevention (Africa CDC) turned to other suppliers. With CDC coordinating direct donations to Africa as a whole, yet even this attempt suffered from many of the same pitfalls as COVAX (Aborode et al., 2021; Soulé, 2022). Therefore, this section will focus on COVAX, which serves as the key example of multinational donation coordination.

The Access to COVID-19 Tools Accelerator (ACT-A) provided a broader umbrella under which COVAX operated as the “vaccine pillar” (de Bengy Puyvallée & Storeng, 2022; Storeng et al., 2023). One of the notable features was the Advance Market Commitment (AMC) for the 92 lowest-income countries, which allowed them to receive doses at little or no cost, supported by donor contributions (Yoo et al., 2022). The goal of COVAX was to ensure that LMICs would not

be entirely overshadowed by the purchasing power of richer countries, yet major obstacles quickly arose. First and foremost, among these was that the same manufacturers who were negotiating with COVAX had already committed large quantities to high-paying bilateral deals. Moreover, production constraints meant that even if COVAX amassed significant funding, vaccines could not be produced rapidly enough to meet global demand. The cutting-edge mRNA vaccines posed a key challenge because the know-how and intellectual property required to scale production were closely guarded by pharmaceutical companies. As a result, technology transfer was limited, and new manufacturers, especially in developing regions, could not come online swiftly enough to fill immediate needs (Binagwaho et al., 2021a; Md Khairi et al., 2022; Zarocostas, 2021).

Although the original goal was to quickly achieve at least 20% coverage in participating LMICs, in practice, supply shortages and ongoing competition delayed the timeline for reaching these targets. Bilateral donations supplemented COVAX's distribution in many instances. Some countries, including China, Russia, and India, opted to donate vaccines outside of COVAX, using direct deals that reflected both humanitarian motives and diplomatic aims. Such “vaccine diplomacy” occasionally accelerated the flow of doses, but it also raised questions about transparency and equity when donors chose specific recipients (de Bengy Puyvallée & Storeng, 2022; Storeng et al., 2023).

Many high-income governments simultaneously pursued a range of strategies that often weakened COVAX's intended mission. Some countries pledged to donate surplus doses but delivered them late or in conditions that reduced their usefulness upon arrival (Pilkington et al., 2022). Others designated specific recipient states for their donations, bypassing COVAX's intended fair-allocation procedure (de Bengy Puyvallée & Storeng, 2022). Although significant quantities did reach struggling regions through these pledges, the timing was not always conducive to large-scale vaccination drives. Late arrivals or doses nearing expiration complicated matters for national health authorities. Many countries depend heavily on donor support, economically, logistically, and politically. These irregular shipments created burdens in scheduling immunization campaigns, training personnel, and ensuring cold-chain capacity (de Bengy Puyvallée & Storeng, 2022; Pilkington et al., 2022; Tagoe et al., 2021).

Agencies such as the WHO and other independent philanthropic foundations also addressed the problem by proposing frameworks and providing funding. The WHO called for prioritizing frontline healthcare workers and high-risk groups worldwide, rather than allowing the entire global supply to be used first by nations with the resources to purchase massive amounts (Pilkington et al., 2022). However, their appeals for equitable distribution encountered resistance in a climate where individual governments, driven by domestic pressures, prioritized their own populations. Manufacturing bottlenecks and intellectual-property restrictions further compounded the issue. While the WHO and similar bodies pressed for more open sharing of vaccine technology, pharmaceutical firms, especially those developing mRNA vaccines, maintained strict control over their proprietary information (Zarocostas, 2021).

COVAX faced major hurdles in part because of the pre-existing bilateral deals that guaranteed quicker or larger deliveries for wealthier buyers (Binagwaho et al., 2021a; Md Khairi et al., 2022). Thus, the demand for equitable access competed in real time against robust profit-driven incentives. Although COVAX had the heroic goal of delivering two billion doses by the end of 2021, it ultimately fell short of this target, partly because it was left negotiating smaller shares of the global supply after lucrative direct contracts had been signed (de Bengy Puyvallée & Storeng, 2022). The broader production slowdowns also played a role. Bottlenecks emerged from shortages of raw materials and specialized equipment, and from the complexities of scaling up manufacturing under rapidly evolving conditions. Even when the supply eventually grew, many donors sent vaccines to COVAX or to recipient nations only after meeting domestic targets, leading to the problem of delayed surpluses arriving as stock that risked expiring (Burgos et al., 2021; Pilkington et al., 2022; Zarocostas, 2021).

For LMICs, dependence on COVAX became evident early on. Countries like Ghana and Bangladesh, for example, pinned their hopes on COVAX, but faced staggered, unpredictable deliveries (Tagoe et al., 2021). This made it difficult to plan vaccination drives with confidence. Health ministries needed clarity on timelines in order to organize clinics, deploy personnel, and secure the necessary cold-chain infrastructure. When shipments arrived intermittently, national campaigns sometimes stalled, leaving citizens uncertain about whether and when vaccine doses would be available. In addition, with funding streams subject to geopolitical considerations and

shifting donor priorities, the unpredictability of supply often left local planners scrambling to adjust (Pilkington et al., 2022; Tagoe et al., 2021).

One of the glaring reminders of how fragile the global vaccine supply chain came from India. The Serum Institute of India (SII), a major manufacturing partner for AstraZeneca and a critical supplier to COVAX, halted and restricted exports when a massive wave of infections gripped the country (Asundi et al., 2021). This was intended to prioritize Indian citizens amidst a crisis, but left multiple LMICs suddenly short of the doses they had anticipated. The interruption illustrated how a single country's domestic emergency could reverberate worldwide, especially where one or two large manufacturers served numerous nations (Gereffi et al., 2022).

From inception, COVAX was anchored in the principle of pooled purchasing power, by collectively negotiating with manufacturers, participating countries, and donors, aimed to obtain doses at affordable prices and on a timeline that would not drastically lag behind that of wealthier buyers (Usher, 2021). In theory, this would mitigate what many feared would become a repeat of earlier unjust patterns in global health crises. However, while it did distribute a substantial number of doses, the actual figures by the end of 2021 were less than half of the promised two-billion-dose mark (de Bengy Puyvallée & Storeng, 2022; Storeng et al., 2023).

Wealthier nations that participated in COVAX often did so alongside more lucrative parallel contracts, ensuring that their domestic populations were covered early. COVAX thus had less market leverage to secure priority agreements. Many manufacturers, seeing a chance for higher returns, allocated their limited early output to states capable of paying top prices (Binagwaho et al., 2021a, 2021b; Md Khairi et al., 2022). That left the mechanism scrambling to purchase what remained or to wait in the queue. When surplus stock eventually built up in certain countries, COVAX requested that they donate unused doses. This was intended to compensate for earlier procurement disadvantages. Yet donations arrived sporadically and were sometimes close to expiry (Pilkington et al., 2022).

Many point out that without COVAX, LMICs might have faced an even worse scarcity of vaccines. COVAX also played a significant role in raising awareness about the need for equitable distribution and in mobilizing resources for technology transfer and manufacturing scale-up (de Bengy Puyvallée & Storeng, 2022; Storeng et al., 2021, 2023). Yet the timeline of

deliveries consistently lagged behind initial promises, and the unpredictability of arrival dates created further hurdles. While large sums of money flowed to vaccine developers, some of whom had already received public funding through other channels, COVAX was unable to secure firm commitments guaranteeing early or balanced delivery schedules. Pharmaceutical companies prioritized deals that maximized profit or were negotiated well in advance. The result was that when vaccines did arrive in LMICs, they were often after HICs had begun or nearly completed their own immunization drives. (Stein, F., 2021; Storeng et al., 2021, 2023).

Nonetheless, COVAX succeeded in establishing a coordinated framework that delivered millions of doses. Studies emphasize that many LMICs, including those without the political or economic means to secure direct bilateral deals, gained a baseline level of vaccine access through this mechanism (Tatar et al., 2021). Although the coverage was insufficient to close the gap with HICs' immunization rates, it may have prevented an even greater discrepancy. Through its organized distribution system, COVAX also prioritized healthcare workers and vulnerable groups, in line with WHO guidelines. Meanwhile, philanthropic and private contributions bolstered aspects of the supply chain, from funding refrigerators for cold storage to underwriting the logistics of shipping doses to remote areas. (Burgos et al., 2021)

Those working to address the shortage of COVID-19 vaccines ranged from international organizations like the WHO to philanthropic donors and the multilateral COVAX initiative, all seeking to overcome bilateral deals and intellectual property barriers. Although they achieved partial successes, these efforts were undermined by market incentives favoring wealthier buyers and by real-time manufacturing constraints that even ample funding could not immediately resolve. Eventually, vaccines did reach many LMICs, mostly through COVAX allocations and various bilateral donations, but the timing and consistency of shipments often presented significant obstacles. The experiences of Ghana, Bangladesh, and other heavily COVAX-dependent nations underscore how unreliable scheduling can hamper large-scale vaccination campaigns (Tagoe et al., 2021). Meanwhile, India's export restrictions revealed how acute domestic emergencies can disrupt global supply (Asundi et al., 2021). Thus, the story of COVID-19 vaccine distribution is one of intertwined successes and failures. A demonstration of the potential of global collaboration, as well as a cautionary tale about the limits of voluntary

cooperation when confronted by entrenched profit motives, national priorities, and persistent structural inequities in global health governance (Castillo et al., 2021; de Bengy Puyvallée & Storeng, 2022; Storeng et al., 2021, 2023).

Direct Nation to Nation Donations

Parallel to the multilateral efforts of the COVAX initiative, bilateral and regional vaccine-sharing arrangements also emerged. HICs such as the US, EU, the United Kingdom (UK), Canada, and Israel became prominent donors, leveraging their substantial vaccine stockpiles secured through extensive advance purchasing agreements. Initially, these countries prioritized domestic vaccination campaigns but later shifted towards donating surplus doses, primarily targeting LMICs, which faced severe vaccine shortages due to limited resources, manufacturing capabilities, and healthcare infrastructure (Jecker, 2023; Mathieu et al., 2021). India, China, and Russia notably engaged in vaccine diplomacy, donating doses directly to neighboring countries or to strategically important countries. These donations served dual purposes: addressing immediate global health needs and enhancing diplomatic relations. China, in particular, extended vaccine aid across Asia, Africa, and Latin America, aligning with its broader geopolitical strategies such as the Belt and Road Initiative. By donating vaccines, China sought to strengthen its global image, especially following initial criticisms of its handling of the pandemic (Lee, S. T., 2021; Suzuki & Yang, 2023)

India similarly leveraged its extensive vaccine production capacity to pursue vaccine diplomacy, launching the "Vaccine Maitri" program. This initiative prioritized neighboring South Asian, African, and Caribbean nations, reflecting India's intent to maintain regional influence and project itself as a responsible global actor amid geopolitical rivalry with China. Russia's donations, predominantly of the Sputnik-V vaccine, targeted former Soviet states and countries in Latin America, facilitating Russia's attempts to regain geopolitical influence and enhance its scientific prestige (Lee, S. T., 2021; Suzuki & Yang, 2023)

HICs, particularly the US and EU member states, also contributed significantly through both COVAX and bilateral channels. Motivations for these donations encompassed humanitarian concerns, pragmatic public health considerations, and strategic interests. Donor countries aimed

not only to mitigate the global spread of COVID-19 but also to prevent the emergence and transmission of potentially vaccine-resistant variants, which could undermine their domestic pandemic response efforts. Additionally, vaccine donations served diplomatic purposes, enabling these nations to project soft power, strengthen international relationships, and reinforce their leadership roles in global health governance (Jecker, 2023; Mathieu et al., 2021; Roope et al., 2022; Ye et al., 2022).

However, despite these substantial transfers, vaccine distribution remained inequitable, often reinforcing existing patterns of geopolitical influence rather than strictly adhering to global health priorities (de Bengy Puyvallée & Storeng, 2022; Storeng et al., 2021, 2023). Ultimately, while vaccine donations played a critical role in alleviating immediate health crises and facilitating vaccination campaigns in underserved regions, they simultaneously highlighted persistent global inequalities. The complex interplay of altruistic humanitarian motivations, pragmatic public health considerations, and strategic geopolitical interests shaped the nature and impact of these donations, underscoring both the interconnectedness and the enduring disparities of the international community's response to the COVID-19 pandemic (Jecker, 2023; Lee, I. & Tipoe, 2022).

Chapter 4: Power Measurement

National Power Measurement

As seen in the previous sections, the notion of power is complex, hard to define, and not agreed upon by researchers in the relevant fields. Therefore, it is no surprise that finding an appropriate way to measure power in IR is difficult. The starting point is military size or military budget. This approach has become outdated because military power is not the only measure of power, and winning wars is not the only way to assess a country's power. Moreover, it has become clear that having the most powerful army is only one part of the equation; how it is used is another (Beckley, 2018; Nye, 2011; Treverton & Jones, 2005). A modern basic measurement usually includes Gross Domestic Product (GDP), population, defense spending, and sometimes includes weighting for innovation in technology (Beckley, 2018; Freeman et al., 2020; Treverton, Gregory & Jones, 2005). Others sought to expand this into a more robust measurement that includes resources and national performance. Resources include the above measurements, while national performance includes more elusive concepts such as external constraints, infrastructure, ideas, and more (Nye, Joseph S., 2011).

Barry Hughes and his International Futures (IFs) model look to expand the above model type and define eight drivers of National Power: domestic sociopolitical, international political, population, economic, agriculture, energy, technology, and environmental resources & quality (Treverton, Gregory F. & Jones, 2005). Ashley Tellis and his RAND colleagues moved to divide power into three interlinked realms: natural resources, national performance, and military capabilities (Tellis, 2001; Treverton, Gregory & Jones, 2005).

Before measuring power, one must decide what it represents: is power best conceived as a means or as an end? Power can be operationalized as either an independent variable or a dependent variable. When treated as independent, researchers focus on the aspects that generate power. When treated as dependent, they study how power is actually used in different situations (Baldwin, 2012; Beckley, 2018; Huang & Ding, 2006). Hart (Hart, 1976) suggested three

approaches to measuring power in international relations: control over resources, control over actors, and control over events and outcomes.

Other approaches agreed with the layout of three elements but see it as three stages: power as a resource, power conversion, and power outcome. This change points to a critical aspect of power: converting power resources into outcomes is not a simple matter and should be done in more useful and “profitable” ways. A country with limited power resources can be more efficient than one with abundant power resources. Also, not all power resources are the same, and can be used differently and more effectively in different situations. (Freeman et al., 2020; Huang & Ding, 2006; Manzenreiter, 2010; Treverton, Gregory & Jones, 2005).

When looking at resources, GDP is most important since it not only indicates the economic power of a country but is also correlated with military power (Beckley, 2018; Freeman et al., 2020; Saradzhyan & Abdullaev, 2021). But looking at GDP, or even a classic military measure such as the number of tanks, soldiers, missiles, and other elements of an army, does not tell the full story. Quality is an important missing part. How do you measure the skill of soldiers? How do you measure the quality and resilience of an economy? And this is just the first part, the resources’ part, of power (Beckley, 2018; Saradzhyan & Abdullaev, 2021; Treverton, Gregory & Jones, 2005).

The second part is power conversion. This is broken up into four components: 1) the ability of states to utilize global resources for domestic activities, 2) a state’s institutions and political structures, 3) civil society (such as values, trust, social capital), and finally 4) social structure such as societal stratification, and ethnic and class divisions (Saradzhyan & Abdullaev, 2021; Treverton, Gregory F. & Jones, 2005).

Therefore, it is not surprising that measuring outcomes has many merits as a way to assess power. Yet control over the outcome is benefited by incorporating collective action, dynamics between countries, and is not limited to different approaches to resources (Beckley, 2018; Hart, 1976). The outcome approach also has the merit of explaining cases where the side with fewer resources triumphed. This approach measures power with a greater degree of granularity (Beckley, 2018; Freeman et al., 2020). But of course, it lacks the simplicity of counting soldiers and using GDP. Another challenge in measuring power as an outcome is the complexity of

deriving a score from many different world events that differ from one another and are hard to compare. Also, such a measurement is post-factum and does not allow policymakers to understand their current power (Beckley, 2018). When attempting to measure power in a nonmilitary context, it is hard to understand who had the upper hand, since it requires knowledge of the preferences of the actor^{iv}. Therefore, scholars choose to measure power using the resources approach, not because it best describes power, but rather because it allows some type of useful power measurement (Beckley, 2018; Freeman et al., 2020).

An example of how power is measured from the resource point of view is as follows. The Composite Index of National Capability (CINC), which is probably the most popular measurement, uses the following calculation: The arithmetic means of the following ratios (Kadera & Sorokin, 2004; Saradzhyan & Abdullaev, 2021):

- Ratio of a country's total population to the world's total population.
- Ratio of a country's urban population to the world's urban population.
- Ratio of a country's steel production to the world's steel production.
- Ratio of a country's primary energy consumption to the world's primary energy consumption.
- Ratio of a country's military expenditures to the world's military expenditures.
- Ratio of a country's military personnel to the world's military personnel.

The arithmetic-mean design embeds a baseline: each proportion's denominator is the sum of all group members' capabilities. Consequently, the entry or exit of any state, or a change in the coding rules that decide who qualifies as a system member, alters every denominator and therefore every CINC score, even when no actor's own resources have changed. Under these conditions, CINC produces measurement artefacts: it can fabricate power transitions that never

^{iv} This of course without even getting into the age-old question of Revealed preference (Sen, 1973).

happened, conceal genuine ones, distort their timing, and exaggerate or understate their magnitude. (Kadera & Sorokin, 2004).

To preserve the relative, multidimensional logic of CINC while eliminating baseline dependence, Kadera & Sorokin (2004) introduce the Geometric Indicator of National Capabilities (GINC). GINC aggregates the same six capability shares with a geometric rather than an arithmetic mean. When a new state joins or leaves the reference group, the geometric mean scales every country's score by the same constant, leaving all dyadic ratios intact; artificial, masked, mistimed, or mis-sized transitions are therefore impossible by construction. GINC retains the practical advantages of CINC: ready availability of data, comparability across dyads and systems, and sensitivity to multiple facets of state capacity (Kadera & Sorokin, 2004).

Others have used a similar type of equation with different weights and different ways to measure economic strength, demographic and size strength, and finally, military strength (Beckley, 2018; Saradzhyan & Abdullaev, 2021). Others also added the capability to employ resources, hinting at the above power measurement strategies, which look beyond just resources. Some researchers also tried to overcome the quality measurement problem by looking at patents as an example of quality (Saradzhyan & Abdullaev, 2021). Critics of the resource approaches suggested that focusing solely on growth and size is misleading and that a balance sheet measure should be used. This is done by looking not only at GDP and army size, but also at the expenses of the country, and judging the net value, since a country with little flexibility will have a hard time using its resources and projecting its power when needed (Beckley, 2018). That is why Beckley suggested a simple measurement of power, adding GDP per capita to control the net output multiplied by GDP, creating a proxy for net resources ($GDP \times GDP \text{ per capita}$)^v. This is done since GDP per capita provides a rough but reliable measure of economic and military efficiency, and GDP accounts for size. Although this approach is simplistic, it does provide an example of

^v Further research in this matter suggested that using Population + GDP + GDP² improves the model as compared to GDP X GDP per capita (Pomeroy & Beckley, 2019).

how, sometimes, adding more variables (such as the CINC) does not add much to the measure, and can supply poorer results (Beckley, 2018; Chang, 2004)^{vi}.

Others have criticized CINC and similar measurements by pointing out three persistent obstacles. First, single-variable proxies, such as territory or GDP, capture only one facet of power and cannot reflect the multidimensional nature of modern statecraft. Second, even multivariable formulas struggle to incorporate intangible soft-power attributes; cultural influence and political credibility resist direct quantification, and existing proxies often supply only partial coverage of these assets. Third, conventional thematic maps used to display power rankings privilege territorial size, thereby exaggerating the influence of geographically large but less capable states and obscuring the true distribution of capacity (Kim, H. M., 2010; Liao et al., 2015).

To address these deficits, Liao et al. (2015) suggest a Sustainable National Power (SNP)-Adjusted Index as the geometric mean of a social sub-index (covering health, education, and societal balance) and an environmental sub-index that captures renewable resource use, biodiversity protection, and carbon emissions performance. The final measure of sustainable national power is obtained by multiplying the traditional Comprehensive National Power (CNP) score by this sustainability coefficient ($SNP = CNP \times \text{SNP-Adjusted Index}$). The form ensures that pronounced weakness in either social or environmental stewardship can nullify otherwise formidable material capabilities, preventing states from masking unsustainable trajectories behind headline economic or military growth. The visual communication problem is mitigated by rescaling national polygons in exact proportion to their power values. These cartograms project geographic borders into a power space in which equal map area denotes equal capability. (Kim, H. M., 2010; Liao et al., 2015).

^{vi} It should be noted that Beckley demonstrated his measurement in war situations such as the cold war and opium war. His measurement is less successful in non-war or quasi-war examples (Beckley, 2018).

Soft Power Measurement

Since Nye brought the concept of soft power to the forefront of IR as the ability to attain desired outcomes through attraction rather than coercion or financial incentives, scholars have grappled with the challenge of clearly identifying and comparatively evaluating indicators of such attraction. Early IR researchers questioned whether analysts should quantify a list of attractive resources, such as cultural artefacts, political institutions, or educational opportunities, or focus on the influence these resources have (Yun Seong-Hun, 2018). GDP has been treated as an enabling resource because wealth finances grand expositions, global media outlets, and spectacular sports tournaments that can augment a state's image (Beckley, 2018). Still, the novelty of soft power relative to long-studied concepts such as military power led researchers to pursue more direct gauges of attraction in an effort to demonstrate the explanatory value and to distinguish it from economic or coercive instruments (Lee, J., 2008; Nye, Joseph S., 2004, 2008; Whitney & Shambaugh, 2009).

One of the first systematic attempts at direct measurement relied on public-opinion data that captures subjective appraisals of foreign countries. The Anholt Ipsos Nation Brands Index epitomizes this reception-centered approach by polling international audiences across six domains: exports, governance, culture, people, tourism, and immigration-investment. Turning diverse perceptions into a single reputation score that is taken to proxy soft power itself (Yun Seong-Hun, 2018). Similar surveys focused on perceived influence rather than mere image, asking respondents to judge how strongly other states affect their own societies (Huang & Ding, 2006; Lee, J., 2008). Such measurements underscore the relational nature of attraction yet inherit classic problems of survey research: social-desirability bias, limited country coverage, and difficulties linking perceptions to concrete policy behaviors.

To supplement opinion polling, researchers assembled composite indices that aggregate resource proxies across multiple dimensions. Treverton & Jones (2005) clustered indicators under culture, education, diplomacy, politics, and economics, while other indexes added Olympic performance, UNESCO heritage listings, academic citations, foreign aid commitments, and the

global reach of television networks (Manzenreiter, 2010; Treverton, Gregory & Jones, 2005; Whitney & Shambaugh, 2009; Yavuzaslan & Cetin, 2016). Yet the meaning of each proxy remains unstable. Tourism revenue, for example, can be read as evidence that foreign publics are already attracted, or instead as a resource, such as national scenery and hospitality infrastructure, that governments leverage to cultivate future appreciation (Yun Seong-Hun, 2018). This duality illustrates the methodological challenge of confusing the means of attraction with its outcomes, obscuring causal direction, and inflating the explanatory power of resources. McClory's New Persuaders index (McClory, 2010) introduced an instructive variation by seeking to measure how effectively existing resources convert into international influence. Compiled for the UK's Institute for Government, the index scored thirty states on diplomacy, governance, culture, education, and business innovation, mixing hard data, foreign aid volumes, think-tank density, UNESCO sites, Olympic medals, with expert assessments of intangible markers such as culinary distinction and signature cultural icons (McClory, 2010; Yavuzaslan & Cetin, 2016). Because the weighting privileged operational performance rather than size, the United States, the United Kingdom, and France emerged as the leading soft-power performers in 2011. Although the design partially separates capacity from deployment, it still embeds discretionary variable selection and relies on expert panels whose judgments may mirror the geopolitical vantage of their home institutions (Yavuzaslan & Cetin, 2016).

A contrasting blueprint appears in Ernst & Young's Rapid Growth Markets index (Ernst & Young Emerging Market Centre, 2012), which narrows the focus to thirty emerging economies and aggregates thirteen variables grouped under global image, integrity, and integration. The resulting league table correlates strongly and positively with GDP, leaving China, India, Russia, and Brazil at the apex of their peer cohort and reaffirming that sheer economic heft often shapes reputational standing (Grincheva, 2022; Yavuzaslan & Cetin, 2016). While the exercise spotlights non-Western contexts, the tight statistical linkage between economic scale and composite score signals that the underlying indicators cannot escape the gravitational pull of material power, challenging the analytical independence of soft power from traditional metrics of national capability (Grincheva, 2022; Yavuzaslan & Cetin, 2016).

Jonathan McClory's widely publicized Portland Soft Power 30 (McClory, 2019) confirms both the appeal and pitfalls of ranking regimes. Its researchers convert six quantitative sub-indices (political institutions, cultural attraction, diplomatic network, higher-education reputation, economic-model allure, and digital engagement) into a single score and then overlay eight perception questions fielded to more than 11,000 respondents across twenty-five countries (Grincheva, 2022; McClory, 2019; Schreiber, 2017; Yun Seong-Hun, 2018). Benchmarks such as the Press Freedom Index, Freedom House scores, the World Bank's Ease of Doing Business, and Times Higher Education rankings implicitly universalize liberal norms. In so doing, the index awards structural advantage to states already conforming to such standards and invites governments to treat annual upward movement on the table as a policy victory, regardless of whether the underlying changes reflect meaningful relational influence or superficial compliance with liberal benchmarks (Grincheva, 2022; Schreiber, 2017; Yun Seong-Hun, 2018). Grincheva (2022) critiques Portland Soft Power 30 and similar soft power measurements on three grounds: 1) they privilege quantifiable proxies at the expense of relational processes, 2) they project Western normative frames globally, a dynamic she labels "data colonisation", 3) and they ignore the geography of reception by reporting a single national figure that erases place-specific variations in attraction (Grincheva, 2022). As a solution, she suggests that soft power might be studied as a situated, iterative process rather than as a static, universal hierarchy (Grincheva, 2022).

A more technical response to earlier arbitrariness is offered by the Global Soft Power Index designed for the International Monetary Fund (IMF). Cevik and Padilha (2024) standardize twenty-nine indicators, group them into six analytically distinct sub-indices, and derive weights through principal component analysis. The groups are composed of commercial prowess, culture, digital footprint, education, global reach, and institutional quality (Cevik & Padilha, 2024). This statistical solution mitigates multicollinearity, replaces discretionary weighting with empirically grounded factor loadings, and produces scores that are directly comparable across sixty-six countries from 2007 to 2021. Crucially, the IMF researchers retain the six sub-indices

alongside the single headline figure, allowing analysts to diagnose which reputational attributes drive overall performance and to test their independent correlations with macro-financial variables such as exchange-rate volatility. In so doing, the framework addresses criticisms that earlier composites obscure the distinct pathways through which different facets of attraction influence external behavior (Cevik & Padilha, 2024).

While indexes grow ever more sophisticated, evaluation practice research warns that institutional incentives shape what gets counted. Pamment (2014) identifies four “articulations” through which soft power is rendered visible: output models track audience exposure; outcome models map communication onto organizational performance targets; perception models monitor shifts in reputation; and network models trace relational leverage through professional or linguistic ties (Pamment, 2014). Each articulation privileges the indicators most amenable to the agency’s accountability structures. For example, the U.S. State Department’s Mission Activity Tracker records event costs and audience numbers because federal oversight demands tangible outputs, not because such metrics capture the subtleties of persuasion. Pamment argues for an interpretive shift that treats measurement as a window onto institutional logics, focusing on why particular indicators are chosen and how accountability regimes mold both practice and evaluation (Pamment, 2014).

Fundamental obstacles still remain. Soft power operates through difficult-to-grasp channels, cultural narratives, value alignment, and diplomatic symbolism, making it difficult to connect resources with behavioral change. For example, Turkish television series may heighten regional admiration, but whether this admiration alters diplomatic alignments or voting patterns in multilateral fora is empirically uncertain (Yukarıç, 2017). Zhang and Wu (2019) trace two dominant methodological templates: one aggregates seventy-eight Western data sets, regresses them onto favorability polls, and extracts variable weights, thereby conflating resource inventories with audience reception; the other relies solely on stratified perception surveys, sacrificing external comparability for informational autonomy (Zhang & Wu, 2019).

Kroenig and colleagues (2010) propose a sequential causal framework designed to clarify these issues: exposure to the sender’s message must occur within a pluralistic information

environment; persuasion must be mediated by sources the audience deems credible and emotionally resonant; and any attitudinal change must reside with actors capable of influencing policy in ways not overridden by material incentives (Kroenig et al., 2010). Measurement experts, therefore, need to verify distribution channels, gauge psychological reception, and trace behavioral consequences. Yet information ecosystems dominated by censorship, misinformation, or conspiracy theories obscure whether foreign messages even penetrate, distrust of self-interested messengers blunts credibility, and material interests often supersede reputational considerations. These challenges underscore why even statistically elegant indicators cannot substitute for process-tracing designs that document influence across the entire communication chain (Kroenig et al., 2010).

Across these diverse contributions, a convergent agenda emerges. There is a need to disentangle resource inventories from audience reception metrics so that the means of attraction are not conflated with their effects. Diversifying data sources beyond Western sources would mitigate normative bias and reduce the tendency to equate liberal governance with soft-power merit (Zhang & Wu, 2019). Transparent and stable weighting procedures, whether via principal component analysis or iterative, expert-guided calibration, are needed to improve comparability over time. Relational indicators such as age-cohort-specific media exposure patterns, bilateral partnership networks, or locality-specific audience responses should supplement traditional resources. Spatially sensitive visualizations can reveal how influence is amplified or dampened by local demographics, competing narratives, and institutional partnerships (Grincheva, 2022).

Across all soft power indexes, a clear common thread is visible: virtually every index includes some blend of cultural expression, political-institutional quality, diplomatic reach, human-capital or educational aspect, economic or commercial strength, and new indexes include a digital footprint (Cevik & Padilha, 2024; Ernst & Young Emerging Market Centre, 2012; McClory, 2019; Treverton, Gregory & Jones, 2005; Whitney & Shambaugh, 2009; Yavuzaslan & Cetin, 2016; Yun Seong-Hun, 2018). Despite some general agreement on the concepts to be measured, there remain key challenges in measuring soft power. First, indicators conflate resources with results (Pamment, 2014; Yun Seong-Hun, 2018). Second, liberal normative bias

permeates data selection, thereby advantaging Western polities (Grincheva, 2022; Zhang & Wu, 2019). Finally, soft power indexes and research struggle to link attraction to behavioral change, leaving the causal claims of soft-power metrics open to contestation (Kroenig et al., 2010; Yukarıç, 2017).

Chapter 5: COVID-19 Vaccine Soft Power Measurement

Initial research on soft power during the COVID-19 pandemic began without delay, even before vaccines were at the forefront. Multiple qualitative case-study research have been conducted, focusing on the EU (Petrovic & Jeremic, 2021), China (Gauttam et al., 2020), Russia (Manfredi-Sánchez, 2022), India (Singh et al., 2022), Japan (Nanayakkara & Wijesuriya, 2021), and other countries. Others have used Nye's soft power framework to analyze the different diplomatic approaches to using the vaccine (Antwi-Boasiako, 2022; Benyera, 2021; Binagwaho et al., 2021b; Su et al., 2021).

Quantitative research on pandemic-era soft power has focused on outcomes that are clearly observable. Early studies turned to foreign news outlets as barometers of attraction. In Italy, a computer-assisted reading of the seven largest dailies found both a surge in mentions of China and a friendlier tone once "mask diplomacy" flights began, treating press volume and sentiment as twin signs of reputational pull (Chen, 2023). A wider scan of 8,082 English-language headlines used machine-learning sentiment and topic models to trace how global attention to China rose and fell across seven thematic clusters during the first half-year of the crisis (Kim, Y. et al., 2023). Moving beyond print, paired corpora of social media posts and broadcast texts showed that rapid vaccine shipments briefly lifted China's image (69.7 percent of 41,233 tweets and 71.3 percent of 57,866 news items were positive), though doubts about safety and the small share of free doses limited the gain (Lee, S. T., 2021). The same pipeline recorded almost universal praise for South Korea's testing and tracing model, with more than ninety percent approval across 8,318 news items and 32,849 social media posts (Lee, S. T. & Kim, 2020). Such media indicators are timely and fine-grained, yet they cannot reveal whether attraction endures once headlines move on.

Surveys offer a firmer behavioral anchor. Cross-national polling series compiled in the Soft Power 30 index provided China's pre-pandemic baseline (Gill, 2020). Two-wave online panels in South Korea, Japan, Singapore, and Hong Kong then compared public confidence in China's zero COVID-19 strategy with views of the USA mitigation approach, showing that medical leadership can sway opinion, but that local context matters greatly (Lin & Meng, 2024). In Latin America, research examined feeling thermometer ratings associated with self-reported

vaccination and with randomized information about Chinese donations. It found that even modest medical aid could soften negative views of an emerging donor while eroding the United States' standing (Urdínez, 2024). A national web survey, including three nations, in early 2022 captured perceptions of USA crisis management, highlighting competence and cooperation as fresh drivers of attraction in East Asia (Zhai, 2025).

Country of origin research sharpens the causal mechanism. Vaccinated Latin Americans expressed greater trust in the government behind the vaccine they received (Barham et al., 2022), while a randomized survey in Zimbabwe showed higher willingness to accept a U.S.-labelled dose than Chinese or South African equivalents when all other attributes were held constant (Nagao et al., 2025).

Where representative polls were unavailable, expert panels filled the gap. Twenty-three Korea specialists across sixteen European states provided rapid assessments of Seoul's pandemic governance, an approach that traded breadth for contextual insight (Cho et al., 2020). Hybrid case studies then triangulate evidence. Work on the Philippines and Vietnam combined document analysis with poll data to gauge the reputational pay-off of Chinese vaccine exports (van Dijk & Lo, 2023). A three-tiered European enquiry linked the Global Soft Power Index, regional polling, and digital-engagement metrics to track the reach of China's "wolf warrior" messaging (Zubair et al., 2023).

The most extensive research mapped China's changing influence in Latin America by combining shipment trackers, regional opinion polls, paired-wave experiments, and twenty-eight months of Twitter sentiment data. The results showed the early boost from Chinese deliveries faded once the USA and European surpluses arrived in late 2021 (Nolte, 2023). Comparative indexes work likewise underscored the role of domestic performance: a Monocle based scorecard weighing crisis management, diplomacy, and business innovation ranked Germany and South Korea ahead of the larger powers during the first wave (Pisarska, 2020). By contrast, a quasi-experimental time-series showed that both China and the United States lost ground overall when 2020 Pew favorability scores were benchmarked against projections from earlier waves (Thomas et al., 2025).

Clear gaps remain: most studies measure short-term feelings, news tone, social media mood, or single-wave polls, so we still lack evidence on how long these perceptions last after the crisis peak. Research is clustered around China, the US, and South Korea, leaving much of Africa, the Middle East, and other countries under-researched. Additional research should include a multi-region project that integrates high-frequency media data, repeated public-opinion measures, and behavioral indicators over time. Only such designs can tell whether the pandemic's bursts of COVID-19 diplomacy turned into lasting changes in soft power.

How is Soft Power Measured in Existing Power Indices

Research quantifying soft power during the pandemic has revealed useful patterns, but it still covers only a few regions and short time spans. Broader and longer-term evidence can be found in large databases, such as those used in research on COVID-19 power measurement. Such databases include The Global Soft Power Index, the Soft Power 30, and the Monocle Soft Power Index. Examining these sources will show what data is already available, where important gaps remain, and how the existing figures can improve our understanding of COVID-19 related influence.

Portland Soft Power 30

The Portland Soft Power 30^{vii} was a Soft Power Index that focused, as clear by its name, on the top 30 countries with soft power (McClory, 2019). The Soft Power 30 is a comparative index that seeks to provide “*the clearest picture of global soft power to date*” (McClory, 2018, p. 12) by systematically measuring the resources that underpin a state's capacity to attract and persuade others. Conceived by the communications consultancy Portland and first published in 2015, and last published in 2019, the index combines large bodies of public data with international opinion

^{vii} <https://softpower30.com/>

polling to offer what its authors describe as the most comprehensive annual ranking of national soft-power assets (McClory, 2019).

Measurement rests on two complementary pillars. Sixty-five per cent of the final score is derived from objective indicators grouped into six sub-pillars: Culture, Education, Engagement, Digital, Enterprise, and Government. These extensive datasets capture everything from tourism flows and museum attendance to diplomatic network size, university quality, internet connectivity, and human development levels. The remaining 35% comes from a multi-country survey that samples public perceptions across all G20 members and several additional regions. Respondents rate each country on eight touchpoints that research shows shape favorability: national cuisine, friendliness to visitors, technology products, luxury goods, foreign policy trust, contributions to global culture, desirability as a place to live, work, or study, and overall favorability. Regression analysis is then used to weight these subjective metrics before combining them with the objective scores into a single composite ranking (McClory, 2019).

Within the academic and IR spheres, the Soft Power 30 has become “*one of the most widely consulted indexes worldwide*” (Yun Seong-Hun, 2018, p. 2), a status reinforced by the endorsement of Joseph Nye, who created the soft-power concept and has praised the project for building on his work (McClory, 2019). Governments monitor their position closely and sometimes adjust policy portfolios when declines appear, treating the annual tables as a benchmark of international attractiveness and a stimulus for reputational strategy (Grincheva, 2022; McClory, 2019; Nisbett & Rofo, 2022).

The index offers several methodological strengths. Its hybrid design recognizes that attraction is produced by both tangible capabilities and the way those capabilities are perceived, a duality many earlier rankings ignored. The breadth of indicators, more than seventy-five by 2019, allows nuanced comparisons among states with very different profiles, while regular updates and explicit statements of data sources enhance transparency and enable longitudinal analysis of soft-power trajectories strategy (Grincheva, 2022; McClory, 2019; Nisbett & Rofo, 2022).

Yet significant flaws limit the explanatory power of Soft Power 30. Critical assessments show that the choice of metrics privileges wealthy liberal democracies and reinforces existing hierarchies because resources such as world-class universities and global media industries are

already concentrated in the states that dominate the rankings. The polling component, though expanded, still relies on online participation and nationally representative samples that may skew toward digitally connected populations and urban majorities, introducing selection biases and underrepresenting poorer nations that are excluded from the outset. Researchers also argue that by collapsing complex political and cultural processes into numerical league tables, the index performs “scorecard diplomacy”, reducing reality to a preferred interpretation that can generate status anxiety and be mobilized to discredit certain regimes rather than illuminate the substantive practice of attraction (Grincheva, 2022; Nisbett & Rofo, 2022). Even the authors concede that an index cannot render “*the total complexity of the dynamics of inter-state relations*” (McClory, 2019, p. 34) and that many indicators, such as mobile-phone density, have been removed after questions about their validity emerged (McClory, 2019).

The analytical framework elaborated in *The Soft Power 30* provides an impressive template for mapping the resources that underpin soft power. Its published series nevertheless ends with the 2019 edition, a limitation acknowledged in the report itself, leaving a chronological gap that begins precisely where the COVID-19 pandemic becomes relevant. Because of this gap, *The Soft Power 30* cannot be used directly in research on COVID-19 power measurement.

Monocle’s Soft Power Survey

Monocle’s Soft Power Survey^{viii} is an annual ranking that the London-based global-affairs and lifestyle magazine Monocle introduced in 2010 (McClory, 2010) and continued, in broadly the same format, until the 2023 edition - Issue 169 (Nisbett & Rofo, 2022). Conceived for an audience of affluent, cosmopolitan readers who treat the magazine’s reports rather like its travel guides, the survey presents the “top nations to visit” in a playful tone, encouraging viewers to “join the conga” of countries that supposedly “got it right” in projecting attraction abroad. Monocle offers no formal definition of soft power and supplies almost no methodological discussion, yet it

^{viii} <https://monocle.com/shop/product/issue-169/>

claims that rising performance in the table signals growing global influence (Nisbett & Rofo, 2022).

Although Monocle never publishes a full list of indicators, each country entry is accompanied by a handful of quantitative items. For example, across the 2018/19 issue these include, among others, the number of embassies, foreign students, Olympic medals, UNESCO World Heritage sites, cultural missions, think tanks, and the value of international aid disbursed (Nisbett & Rofo, 2022). In narrative comments, the survey also cites sporting triumphs, space launches, tourism appeal, and perceived governmental cosmopolitanism, thereby touching on Joseph Nye's three broad categories of culture, political values, and foreign policy. The varied mix is intended to capture national attractiveness, but the absence of consistent metrics across cases prevents systematic comparison (Nisbett & Rofo, 2022).

Early acclaim portrayed the survey as path-breaking. Portland Communications, when launching its own Soft Power 30 index in 2015, praised Monocle for identifying and categorizing "*the various sources of soft power*" (McClory, 2015, p. 19) and for combining objective data with expert judgements. The index, therefore, helped normalize the idea that soft power can be arranged and ranked, giving diplomats and journalists an eye-catching shorthand for national prestige (McClory, 2019; Nisbett & Rofo, 2022).

Yet academic scrutiny exposes significant limitations. Monocle refuses to disclose how its figures are gathered or weighted, and even customer-service staff could not supply methodological details when pressed by researchers. Different metrics appear under different country profiles, rendering the exercise impressionistic rather than analytical, and its commentary relies heavily on cultural stereotypes, matadors for Spain, pandas for China, and sumo wrestlers for Japan, which reduce complex societies to tourist clichés. Systematic biases follow, as in the 2018/19 table, only six of twenty-five places go to states outside the Western liberal fold, while democracies aligned with market capitalism dominate the top tier (Nisbett & Rofo, 2022).

Monocle's Soft Power Survey cannot be treated as a dependable data source because the magazine offers no definition of soft power, no explanation of indicator selection or weighting, and lacks methodological details. There also seems to be a lack of internal consistency required

for cross-sectional or longitudinal comparison. Because back issues are available in digital format and no dataset is provided, assembling anything approaching a continuous time series would require extensive archival work. Together, the opacity of methods, inconsistent metrics, normative bias, and the absence of publicly accessible data across all years render the Monocle survey unsuitable for analysis of COVID-19 soft power.

Lowy Institute Asia Power Index

The Lowy Institute's Asia Power Index has been published every year since 2018^{ix}. It compares twenty-seven Asia-Pacific countries and territories, ranking them by how much they can shape events around them. The ranking draws on 131 indicators, grouped into eight themes, combining soft and hard power aspects. Four themes measure a country's resources (economic strength, military strength, resilience, and future resources), while the other four measure how a country uses those resources (economic ties, defense partnerships, diplomatic reach, and cultural reach). Scores are normalized, and thorough sensitivity tests are conducted to assess their robustness. An online calculator lets anyone change the weight of each theme and see how the table shifts, a level of transparency rare among large power indices (Shaharuddina et al., 2024; Susannah Patton et al., 2024).

Soft power is captured primarily through the Cultural Influence theme, which accounts for 10% of the total score. This theme is broken into three parts. Cultural projection counts reputation-building exports and symbols of prestige, such as famous brands, UNESCO sites, skyscrapers, and the freedom of travel granted by a country's passport. Information flows measure regional interest in a country's media and universities, using search data from platforms like Google and Baidu. People exchange record diaspora size, migration appeal, tourist flows, and flight links. Diplomatic Influence also contains elements of soft power, such as network size, multilateral

^{ix} <https://power.lowyinstitute.org/> , Unofficial API: <https://github.com/algocry/lowy-index-api-docs>

activity, and leadership image, but it is kept separate from Cultural Influence to avoid conceptual overlap (Shaharuddina et al., 2024; Susannah Patton et al., 2024).

The Index is now widely used in academic work on power politics (Gooch et al., 2022; Shaharuddina et al., 2024). Certain features explain its popularity. The wide range of indicators allows researchers to study many forms of power without piecing together data from scratch. The clear weighting scheme and evidence that indicator differences, not weight choices, drive results, reduce worries about hidden bias while signaling what the compilers think matters most today (Gooch et al., 2022; Shaharuddina et al., 2024).

The same design also brings well-known limits. Weightings, though adjustable, are ultimately subjective. Many indicators are proxies; therefore, some soft-power facets are only partly captured and may suffer from data gaps or language bias (Gooch et al., 2022; Susannah Patton et al., 2024). Researchers often add extra variables to cover factors they believe are missing. Because the Index focuses on Asia, it is less useful for direct comparisons with other regions unless combined with global datasets (Gooch et al., 2022; Shaharuddina et al., 2024).

From 2020 through 2024, the Asia Power Index traced the evolving impact of COVID-19 on the region. The pandemic altered both the material foundations of power (economic capability and resilience) and the capacity to wield influence (vaccine diplomacy and international engagement), with long-term implications that continued to shape power distribution even after the acute phase of the crisis.

In 2020, the Index highlighted COVID-19 as a transformative force inaugurating what it termed a “race to the bottom” in regional power. Almost all countries suffered declines, with the United States recording the largest single-year decline. To account for the pandemic, the 2020 Index added indicators assessing public perceptions of national and international COVID-19 responses (Alyssa Leng & Hervé Lemahieu, 2020).

In 2021, the Index deepened its pandemic-related measurement by incorporating indicators of vaccine diplomacy, including domestically administered doses, regional vaccine donations, and per-capita donations. These additions reflected how soft power was increasingly exercised through public health efforts. That year saw a near-universal decline due to prolonged economic dislocation, disrupted diplomacy, and internal instability. Despite this trend, the United States

rebounded modestly and surpassed China in two critical measures, even as China saw its first overall decline in power (Alyssa Leng & Hervé Lemahieu, 2021).

By 2023 (there was no 2022 report), the long-term effects of COVID-19 became more pronounced in the Index's assessments, yet the Index did not include COVID-specific indicators that were included in 202-2021. Many states remained less resilient than before the pandemic, and China in particular faced steep losses due to its prolonged "zero-COVID" policy, causing its soft power and economic relationships to suffer (Susannah Patton et al., 2023).

In the 2024 Index, most countries began to recover, but China's power plateaued. While others rebounded from pandemic-induced setbacks, China struggled to reclaim pre-pandemic momentum in economic capability and regional investment influence. Notably, the Index showed China's future resources score declining, reflecting demographic and economic constraints exacerbated by the pandemic era (Susannah Patton et al., 2024).

Despite its methodological sophistication and valuable insights into regional power dynamics, the Asia Power Index cannot be used as the basis for a global analysis of soft power during the COVID-19 era. Its geographic limitation of twenty-seven Asia-Pacific countries and territories makes it unsuitable for cross-regional comparisons or global assessments. A global study requires data that span all continents and include major and minor powers alike, which this index does not provide. Nonetheless, its approach to decomposing power into resource and influence components, as well as its detailed treatment of COVID-19 soft power, offers valuable conceptual and methodological tools.

The Anholt-Ipsos Nation Brands Index

The Anholt-Ipsos Nation Brands Index (NBI) is a longstanding survey instrument designed to gauge how international publics perceive the overall image of sixty prominent states. Ipsos has administered the study every year since 2008, interviewing roughly 60,000 adults across twenty advanced and emerging economies and weighing results to mirror the demographic profiles of each online population (Ipsos & Simon Anholt, 2022; Papp-Váry). Simon Anholt originally conceived the index as an extension of his "Competitive Identity" framework, and Ipsos describes it as "the world's only comprehensive global nation brand survey", used by

governments and businesses to understand and shape national reputation (Anholt Ipsos, 2021; Ipsos & Simon Anholt, 2021a; Papp-Váry).

Soft power attributes are captured through six equally weighted dimensions that form the “Nation Brand Hexagon”. These are Exports, Governance, Culture and Heritage, People, Tourism, and Investment & Immigration. Each dimension aggregates three to five scaled items: for example, Exports blends perceptions of technological innovation, country-of-origin appeal, and creative capacity, while Governance covers competence, fairness, environmental stewardship, peace, and poverty reduction. The same principle applies to the other dimensions: Culture samples heritage and contemporary arts; People capture warmth and professional quality; Tourism examines natural and built attractiveness and travel intent; and Investment & Immigration assesses quality of life, educational appeal, and openness to talent. By averaging scores across these six facets, the NBI produces an overall reputational ranking that policymakers often treat as a proxy for a country’s soft power (Ipsos & Simon Anholt, 2021a, 2023; Papp-Váry; Siân Hughes, 2024). Over the past two decades, the NBI has gained significant attention in policy circles; foreign ministers and prime ministers are reported to consult its rankings before making strategic decisions, reflecting the index’s perceived authority as a barometer of national image. Its longitudinal consistency and rigorous sampling lend credibility, while the breadth of attributes offers a multidimensional picture of how countries are viewed beyond hard-power metrics (Anholt Ipsos, 2021; Ipsos & Simon Anholt, 2021a, 2021b, 2023; Papp-Váry; Siân Hughes, 2024).

Although the Nation Brands Index remains a valuable barometer of reputational standing, its design imposes significant constraints that limit the weight that policymakers and academics can place on its results. Ipsos concedes that the survey offers only a “snapshot” of attitudes and “*does not explore why respondents feel the way they do*” (Siân Hughes, 2024, pp 18); it reports perceptions rather than verifying whether those perceptions mirror actual performance. The proprietary methodology surveys only online adults in twenty countries, so opinions from large parts of the world are modelled indirectly, while offline publics are excluded, and several states of geopolitical importance are not covered at all. Internet-based fieldwork may further skew responses toward more connected populations, and cultural variation in the salience of

individual dimensions can introduce interpretive ambiguity. Because the list of nations measured expanded from fifty to sixty in 2021, shifts in ranking around that date can reflect a design change rather than genuine image movement, and overlap among dimensions complicates precise attribution. (Fetscherin, 2010; Papp-Váry; Siân Hughes, 2024).

The Nation Brands Index does not incorporate any dedicated questions on public health or the COVID-19 pandemic management. Yet Anholt argues that a country's image is influenced less by its domestic handling of the virus than by perceptions of its wider contribution to humanity, remarking that "*country images are unlikely to be affected by domestic factors: how well or badly a country has managed the pandemic, for example*" (Simon Anholt, 2020, p. 3). COVID-19 appears in the Nation Brands Index only as an explanatory backdrop for year-to-year movements in the existing six dimensions; it has not been operationalized as an additional indicator, nor has it altered the index's underlying questionnaire (Siân Hughes, 2024; Simon Anholt, 2020).

Overall, the Nation Brands Index remains a useful way to see how specific online audiences rate countries across six reputation themes. Yet several limits mean it cannot stand alone for this research. First, NBI surveys only internet users in twenty countries, so the results are not truly global and cannot be checked easily by other scholars. Second, the index is built around the idea of a national brand and omits other key aspects of soft power. The NBI can therefore provide one piece of the soft-power puzzle, but broader, openly available measures are still required to give a complete picture. Therefore, this index will not be used in this thesis.

ISSF World Soft Power Index

The Indian Strategic Studies Forum (ISSF) World Soft Power Index was first released in 2022, with a more comprehensive 2023 release that included the methodology and additional information. The index attempts to offer a barometer of how states convert attraction into international influence (Indian Strategic Studies Forum (ISSF), 2022; Udayan Raj Singh, 2023).

The index combines perception-based evidence with objective statistics. Two parallel surveys, one for a global general public sample and another for subject-matter specialists, generate

attitudinal data, while a second separate module allocates points to hard indicators. ISSF groups its measures into two broad pillars (Udayan Raj Singh, 2023). Economic and political indicators include: 1) political stability, 2) passport strength, 3) influence in multilateral institutions, 4) stability of economy and currency, and 5) economic aid disbursed. Social and cultural criteria include: 1) global entertainment and media penetration, 2) international understanding of a country, 3) brand recognition, 4) COVID-19 aid and response, 5) recognition of cultural symbols, and 6) tourism performance, where tourism itself merges infrastructure, receipts, and visitor satisfaction (Udayan Raj Singh, 2023). In addition, narrative essays tie the results to “Soft Power’s Response to Geopolitical Events” and to the COVID-19 repercussions, underscoring the index’s ambition to remain sensitive to contemporary shocks (Udayan Raj Singh, 2023). The index presents the questionnaire findings only in headline form. It does not disclose how many individuals were surveyed or how many countries were assessed. Instead, it lists the top 25 countries overall and the top 10 for each indicator, yet it withholds the underlying scores. This lack of methodological transparency, narrow geographic coverage, and absence of repeatable indices, together render the ISSF index impracticable for this thesis.

Elcano Global Presence Index (GPI / IEPG)

The Elcano Global Presence Index (GPI / IEPG, the Spanish acronym)^x has been published every year since its inaugural 2010 edition, released in 2011. The index also traces data to 1990, with data from 1990, 1995, 2000, and 2005, and uninterrupted annual updates from 2010 onward. Its geographical scope has widened from the fifty-four economies analyzed in the pilot study to 120 countries by 2018 and to 150 in the 2025 release, covering most of the world population. The index includes sixteen indicators: five economic, two military, and nine soft, in order to create

^x <https://www.globalpresence.realinstitutoelcano.org/>
API: <https://www.globalpresence.realinstitutoelcano.org/en/swagger>
Methodology: <https://www.realinstitutoelcano.org/en/work-document/the-elcano-global-presence-index-methodology/>

a holistic, data-driven picture of a state's presence (Anghelescu, 2021; Olivie & Molina, 2011; Olivie & Santos, 2023; Santos & González, 2025).

Soft power in the IEPG is created through nine variables that register the cross-border circulation of people, ideas, and value (Olivie & Molina, 2011; Olivie & Gracia, 2020b; Olivie & Santos, 2023):

1. **Migration** is measured by the United Nations estimate of immigrants resident in each country at mid-year.
2. **Tourism** is measured by using the UN World Tourism Organization count of non-resident arrivals at frontiers.
3. **Cultural outreach** is measured by the value of audiovisual service exports, including film, television, and recorded music, drawn from the WTO's trade statistics.
4. **Sports** are measured by FIFA world ranking, other football (soccer) leagues' standings, and medals won at the Olympic Games.
5. **Information** measures the number of references to a country in the principal global news-agency wires together with international Internet bandwidth, capturing both media salience and digital reach.
6. **Technological projection** is measured by the foreign-oriented patent families filed in at least one overseas jurisdiction, a high-threshold metric of inventive ambition recognized by WIPO.
7. **Scientific presence** measures the number of articles indexed in the Web of Science across natural sciences, social sciences, and the humanities, attributing each paper to the author's institutional address.
8. **Educational outreach** is measured by the number of tertiary students of foreign nationality enrolled in domestic institutions, sourced primarily from UNESCO and, where necessary, OECD iLibrary.
9. **Development cooperation** is measured by the gross official development assistance disbursements, including both bilateral and multilateral outlays, as compiled by the OECD.

All nine indicators are rescaled to a common 0-1000 metric and aggregated with fixed weights that were elicited from an expert survey, ensuring transparency and stability over time (Olivié & Molina, 2011; Olivié & Santos, 2023).

Because the index relies solely on objective transnational statistics, scholars value it as a rare hard data complement to reputation surveys. Studies of globalization trends, middle-power behavior, and educational attraction regularly cite its soft-presence scores, and the project's public website provides open access to underlying data and replication code, a degree of methodological disclosure that outstrips many rival composites (Anghelescu, 2021; Garza-Giron & Schiavon, 2019; Wojciuk et al., 2015). Yet the same design entails limitations. Presence is not influence - the index does not tell us whether a country's cultural exports persuade audiences or whether its aid actually builds goodwill. More fundamentally, the circulation captured by many of these indicators can be read less as "soft power" and more as the extent to which a country is embedded in, and shaped by, social and cultural globalization. In this view, high volumes signal connectivity and exposure to global flows, not necessarily a state's capacity to convert them into attraction or leverage^{xi}. Quality differentials within a given flow remain invisible, and results are based purely on volume, which can look counterintuitive. Finally, the data arrives with a major time lag, so the index cannot capture very recent events in real time (Olivié & Molina, 2011; Olivié & Gracia, 2020a, 2020b).

The COVID-19 pandemic illustrates both strengths and constraints. An Elcano briefing anticipated an abrupt contraction in people-based variables such as tourism, migration, and student mobility. This contraction was anticipated to be offset by greater weight for science, technology, and information as vaccine research and digital traffic surged. The 2025 results confirm the prediction: the soft dimension has regained ground after the global health emergency, even as the economic pillar remains subdued, indicating that post-pandemic

^{xi} I thank my advisor, Professor Sara Kahn-Nisser, for providing this criticism of soft power components in The Elcano Global Presence Index

globalization is leaner, more digital, and more contested (Olivié & Gracia, 2020a, 2020b; Santos & González, 2025).

The IEPG has had continuous coverage since 2011; its rich indicators, a worldwide set, fully documented methodology, and freely downloadable datasets make it an almost perfect match for this thesis. Nevertheless, the absence of opinion polling and brand-reputation metrics requires that this index be complemented by sources that capture perceptions and narratives, because volumes of presence alone cannot tell the whole soft-power story.

Pew Global Attitudes Survey

Pew Research Center's Global Attitudes Survey, formally launched in 2001 and fielded almost every year since, has become one of the world's most widely cited cross-national opinion studies. It interviews nationally representative samples in dozens of countries using rigorous, mixed-mode methods to trace how publics view their own lives, major global issues, and the international role of leading powers. Over nearly a quarter-century, it has completed more than 800,000 interviews in more than 110 countries, producing a rich time series that scholars, journalists, and policymakers use to gauge the pulse of world opinion (Passel & Cohn, 2018).

The survey is a continuing series of multinational polls that measure attitudes on politics, economics, society, culture, and international relations. Pew describes it as a broad array of worldwide public-opinion surveys whose findings are released in thematic reports accompanied by open micro-datasets and detailed methodological appendices (Passel & Cohn, 2018).

However, despite its undeniable value for tracking global public opinion, the Global Attitudes Survey is ultimately not suited for the specific measurement strategy adopted in this thesis. The country roster and questionnaire modules vary substantially from wave to wave, making it impossible to construct a consistent dataset for 2019-2024.

IMF Global Soft Power Index

In an IMF working paper by Cevik and Padilha (2024), the Global Soft Power Index (GSPI) is defined as a comprehensive composite measure that captures the diverse facets of soft power for

a broad sample of countries from 1990 to 2021. It is built on a foundation of twenty-nine indicators organized into six functional dimensions: commercial prowess, cultural influence, digital footprint, educational attainment, global reach, and institutional strength. It then follows a three-step methodology to create both a headline index and the component-level scores (Cevik & Padilha, 2024).

Despite its promise as a systematic approach to measuring soft power, the GSPI does not extend beyond 2021, is limited to a sample of 66 countries, and does not provide access to the underlying dataset or a complete ranked list of scores; it is marked as a work in progress. Therefore, it will not be used in this thesis

The Global Soft Power Index (GSPI) / Brand Finance's Global Soft Power Index

The Global Soft Power Index (GSPI) by Brand Finance^{xii} is a perception-based index that compares the relative attraction of states across a wide sample of the world's publics and expert observers. It was first released in 2020 and is now in its sixth consecutive waves released for 2025. The index attempts to translate Nye's notion of attraction into an empirical dataset by using large-scale opinion polling and secondary indicators (Brand Finance, 2024, 2025; Haigh & Finance, 2020). Across those six years the sample of rated countries has expanded drastically, the first edition covered sixty states, the following release already gauged perceptions of sixty states through surveys in one hundred markets (Lee, S. T., 2021), intermediate studies took the roster past one hundred (Wüst & Nicolai, 2023), and the 2024 edition reports scores for all 193 United Nations members after interviewing 172,133 adults in 101 economies (Brand Finance, 2024).

Methodologically, GSPI combines three key perception concepts: Familiarity, Reputation, and Influence, with a set of substantive performance pillars that embody the resources widely associated with soft power. The seven pillars include Business and Trade, Governance,

^{xii} <https://brandirectory.com/softpower>, Dashboard:
<https://brandirectory.com/softpower/ranking?region=1&metric=1&fromRegion=1> , API:
<https://admin.brandirectory.com/api/gsp/waves>

International Relations, Culture and Heritage, Media and Communication, Education and Science, and People and Values (Lee, S. T., 2021; Tella, 2021). The 2024 iteration adds an eighth, Sustainable Future, to capture environmental leadership, which continued also in the 2025 iteration (Brand Finance, 2024, 2025). Respondents score thirty-five attribute statements included within these pillars, and regression analysis is then used to estimate each pillar's weight in shaping Reputation and Influence, producing a 0-100 score for every state (Brand Finance, 2024, 2025). Supplementary aspects, such as a Recommendation module (investment, study, trade, tourism, and migration willingness), are now also part of the core index (Brand Finance, 2024, 2025).

Academics and practitioners treat the GSPI as a prominent, if contested, index. Its breadth of survey coverage, the inclusion of both mass and elite opinion, and its thematic differentiation make it more comprehensive and acceptable than earlier rankings such as Portland's Soft Power 30, particularly for regions earlier indexes ignored (Tella, 2021; Wüst & Nicolai, 2023). Governments routinely cite year-on-year movements to justify or recalibrate public-diplomacy strategies (Brand Finance, 2024, 2025).

Yet GSPI is not without a flaw. The index's reliance on perceptions means that short-term media narratives can overshadow deeper structural capabilities, as illustrated when adverse coverage of the COVID-19 depressed China's 2021 position despite rapid economic recovery (Lee, S. T., 2021). Critics also note the methodological complexity of precisely weighting the pillars (Næss, 2023) and the absence of culturally specific indicators to capture non-Western sources of attraction (Tella, 2021). Multicollinearity among pillars forces some researchers to collapse them into broader composites, reducing analytical granularity (Taecharungroj & Pattaratanakun, 2025), while Internet-based panels over-sample younger and more educated respondents in low-connectivity societies (Brand Finance, 2024, 2025). Finally, although the 2024 and 2025 editions aspire to global coverage, earlier waves excluded many middle-income states, limiting longitudinal series for those cases (Haigh & Finance, 2020; Wüst & Nicolai, 2023).

The COVID-19 pandemic quickly became a touchstone for the GSPI. During the critical phase of the COVID-19 pandemic, Brand Finance introduced a one-off metric that asked the world public to rate national pandemic responses, but this variable has since been retired, and the

reputational effects of health diplomacy are again absorbed indirectly through the existing governance, science, and international-relations pillars (Brand Finance, 2024) Yet 2021 data quickly showed how pandemic management could affect soft-power: China fell from fifth to eighth as doubts over transparency hurt its governance standing, even as its vaccine research lifted its science score (Lee, S. T., 2021). Even better, states perceived as generous donors or as ones who care about public health recorded a rise in soft power, demonstrating that the GSPI captures COVID-19 soft power not only through a dedicated health pillar but through multiple aspects, including the view of a nation's institutions, scientific prowess, and international responsibility (Grix & Brannagan, 2024; Lee, S. T., 2021).

The Global Soft Power Index is a key perception-driven soft power index. The reliance on large sample polling, regression-derived weights, and a published attribute list gives the index a relatively transparent methodology and allows for an unusually fine-grained analytical breakdown of reputational resources. Further strength lies in its expansion of coverage. What began in 2020 with only sixty rated states now includes all 193 United Nations members, offering a genuinely universal index of national attractiveness. The same design, however, imposes clear limitations. Because data collection started only in 2020, there is no baseline for the pre-COVID era. Early editions omitted many middle-income countries until at least 2023, further complicating longitudinal analysis. And although Brand Finance releases headline scores and selected cross-tabulations at no cost, deeper microdata remains gated, and there is no publicly documented API or other programmatic access. Yet GSPI remains a key data source for soft power analysis despite its many weaknesses, since there are very few perception-based indices, and this is the chief among them.

FutureBrand Country Index (FCI) / Country Brand Index (CBI)

The FutureBrand Country Index (FCI) is a perception-based ranking that treats nations as if they were corporate brands. Building on earlier "Country Brand Index" editions from the mid-2000s, the relaunched studies in 2014, 2019, and 2020 reorder the World Bank's seventy-five largest economies not by GDP but by the intensity and balance of the associations that people hold toward each place. The underlying premise is that identity and reputation constitute a form of

capital that can attract visitors, students, investors, and buyers more effectively than economic size alone (*Country Brand Index 2014-15*, 2015; *Country Brand Index 2019*, 2019; *Country Brand Index 2020*, 2020; Plapler et al., 2005).

Methodologically, the index combines quantitative online surveys with qualitative expert input. Polling ~2,500 “opinion-formers and frequent international travelers” globally distributed frequent flyers who each rated seven countries. The questionnaire follows a proprietary Hierarchical Decision Model that moves from awareness to visitation and advocacy, but the ranking itself weights most heavily the six association dimensions that map onto soft-power resources: Value System, Quality of Life and Business Potential (collectively labelled Purpose or Status), plus Heritage & Culture, Tourism, and “Made In” product perceptions (grouped under Experience) (*Country Brand Index 2014-15*, 2015; *Country Brand Index 2019*, 2019; *Country Brand Index 2020*, 2020).

Since the FCIs’ last wave was published in 2020, the index offers only an early-pandemic snapshot and cannot capture the shifts during the later phases of Covid-19. Because this thesis aims to trace soft-power gains across the full pandemic period and cover more than 75 countries, it will therefore be excluded from the analysis.

In summary, the two key indices that will be used in the thesis are the soft power measurements contained in the Elcano Global Presence Index (IEPG), which will provide the resource-based aspect of soft power, and the Brand Finance Global Soft Power Index (GSPI), which will provide the perception-based aspect of soft power. For a summarized list of soft power and nation brand measurements discussed in this chapter see Appendix G.

COVID-19 Data

The second category of data required to measure the soft power impact of COVID-19 vaccine donations concerns the pandemic itself. Two complementary elements are needed. The first, which lies at the heart of this thesis, is the volume and timing of vaccine donations, which serve as the primary explanatory variable. The second element assembles broader epidemiological indicators for each recipient state, thereby providing essential context. The underlying assumption is that a donation delivered to a country severely affected by the pandemic will be perceived as more valuable than an identical donation to a country with a lighter disease burden. Few attempts have been made to track the flow of COVID-19 vaccines during the pandemic. COVID-19 vaccine doses donated to COVAX have been tracked until 2022¹³, and the WTO-IMF COVID-19 Vaccine Trade Tracker tracked “*trade and supply of COVID-19 vaccines by product, economy and arrangement type*” up to 31 May 2022, but marked as preliminary with only aggregated data available¹⁴. Some states tracked their specific donations, including the USA¹⁵, the United Kingdom (UK)¹⁶, India¹⁷, Canada¹⁸, and many others. Two key initiatives captured COVID-19 donation flows: the COVID-19 Market Dashboard by UNICEF and Launch and Scale Speedometer COVID Vaccine Donations.

¹³ <https://ourworldindata.org/grapher/covax-donations>

¹⁴ https://www.wto.org/english/tratop_e/covid19_e/vaccine_trade_tracker_e.htm

¹⁵ <https://2021-2025.state.gov/covid-19-vaccine-deliveries/>

¹⁶ <https://lordslibrary.parliament.uk/global-covid-19-vaccine-donations-uk-contribution/>

¹⁷ <https://www.mea.gov.in/vaccine-supply.htm>

¹⁸ <https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19/vaccines/supply-donation.html>

COVID-19 Market Dashboard by UNICEF

The COVID-19 Market Dashboard by UNICEF¹⁹, maintained by the organization's Supply Division, is a public database that collates administrative records of the quantities of COVID-19 vaccine doses dispatched to each country through all recognized procurement channels, including COVAX, bilateral and multilateral agreements, and philanthropic donations. Its central function is to provide transparent, standardized information on the supply side of the global vaccination campaign (Kumari & Dey, 2024; UNICEF, 2024). Vaccine donations are marked as last updated on May 13, 2024, and include the following data: *Donor - Recipient - Mechanism – Vaccine, Recipient, Mechanism, Vaccine name, Vaccine developer, Manufacturer, Donated doses, Facilitated doses, Doses delivered*. The dataset is available for download as a table file and is also included in a Power BI dashboard. Missing from the data are the dates of donations – a critical aspect of COVID-19 vaccine donations.

The COVID-19 Market Dashboard is found by researchers to be the empirical backbone of research into vaccine distribution, including specifically in relation to soft power and Vaccine Diplomacy (de Bengy Puyvallée & Storeng, 2022; Surianta & Dressel, 2025; Vadlamannati & Jung, 2023). With many finding this Dashboard as the prime, and sometimes sole, source that offers comparably comprehensive, country-level coverage of inbound vaccines from multiple sources (Alonso Ruiz et al., 2024; Arroyo et al., 2024; Bak et al., 2024; Kumari & Dey, 2024; Saeed & Kohler, 2025; Surianta & Dressel, 2025; Vadlamannati & Jung, 2023).

Launch and Scale Speedometer COVID Vaccine Donations

The Duck University Launch and Scale Speedometer COVID Vaccine Donations²⁰ data track COVID-19 bivalent vaccine purchases, vaccine donations, and therapeutics through May 5, 2023

¹⁹ <https://www.unicef.org/supply/covid-19-market-dashboard> , https://unicef-my.sharepoint.com/:x:/g/personal/tadino_unicef_org/EV6ICM0-Ve9EkJ-0uYvUOG0BK15jhor_8C_m1WsFLsPTA?rttime=U7TolWu53Ug

²⁰ <https://launchandscalefaster.org/COVID-19>

(Duke Global Health Innovation Center, 2023). The broader framework was developed because most existing scaling models were primarily conceptual. They described what ought to happen but offered no standard indicators by which to measure progress. By contrast, the Speedometer “fills the gap in the field by providing measurable indicators to assess the scale of health interventions” (Crissman et al., 2023) yielding a repeatable method for quantifying how quickly and how fully lifesaving technologies reach the populations that need them (Borges et al., 2022; Crissman et al., 2023). The following data is available on Vaccine Donations: *Date Last Updated, Donating Entity, Donating Entity Three Letter Country Code, Donating Country Economic Status, Donated to, Population, Receiving Country Economic Status, Receiving Country Three Letter Code, Receiving Country Continent, Vaccine, License Holder, Mechanism, Donation Date, Donation Amount, Doses Delivered, Notes, Source*. As can be seen, the Launch and Scale Speedometer data are more detailed, with particularly valuable information on donation dates and well-documented sources.

The COVID Launch and Scale Speedometer is also a key source of data for researchers for empirical analysis of vaccine distribution. Many key publications regarding COVID-19 use it as the prime, and sometimes sole, source that offers comprehensive data on COVID Vaccine Donations (and other such as COVID Vaccine Purchases, Vaccine Manufacturing, and Therapeutics) (Agarwal & Reed, 2021; Arakpogun et al., 2022; Borges et al., 2022; Usher, 2021; Uskoković, 2021). Little research has used both Launch and Scale Speedometer COVID Vaccine Donations and The COVID-19 Market Dashboard by UNICEF (Ferranna, 2024; Mao et al., 2023; Nolte, 2023) and only one empirical one uses the data from both (Puri et al., 2024).

Global COVID-19 Tracker

Unlike data on COVID-19 vaccine donations and sales, data on COVID-19 cases and deaths are commonly available from a staggering number of sources²¹ (Bashir et al., 2022). The data source

²¹ Separate research should uncover the reason for this disparity in public interest and accessible data.

that will be used is the most reliable source possible, the WHO COVID-19 dashboard²² by the Health Emergencies Program of the World Health Organization (WHO) (World Health Organization, 2023). This data will be processed by OurWorldinData, which created the Coronavirus (COVID-19) Cases dashboard²³ (Mathieu et al., 2020). The data includes: *Country*, *Cumulative number of confirmed COVID-19 cases*, *Cumulative number of confirmed COVID-19 deaths*.

V-Dem Democracy Indices & Additional Data

Additional data needed for this research is available for the World Bank's Data360 (formerly known as the Open Data portal), such as Population density (people per sq. km of land area), GDP (current US\$), Trade (% of GDP), and Foreign direct investment, net inflows (% of GDP). These variables matter because they capture a country's economic openness and international embeddedness, which shape the visibility, relationships, and credibility that often underpin soft-power outcomes. In practice, they help determine whether observed reputational gains are plausibly linked to vaccine diplomacy rather than to broader patterns of global integration and economic attractiveness.²⁴.

Democracy indices will be taken from the V-Dem Democracy Indices²⁵. The reason for this is that extensive research into democracy indices has pointed out V-Dem as the most precise and clear one among the democracy indices (Boese, 2019; Coppedge et al., 2017; Paldam, 2022; Vaccaro, 2021). Specific data that will be used is the *Liberal democracy index* (Coppedge et al., 2025) which captures both electoral competition and liberal constraints such as civil liberties and checks on executive authority, and the *Political regime classification* based on the Regimes of

²² <https://data.who.int/dashboards/covid19/data?n=c>

²³ <https://ourworldindata.org/covid-cases>

²⁴ <https://data.worldbank.org/indicator/> , API: <https://data360.worldbank.org/en/api>

²⁵ <https://www.v-dem.net/> , data: <https://www.v-dem.net/data/the-v-dem-dataset/>

the World classification (Lührmann et al., 2018), which enables clear comparisons across regime types for non-linear differences in soft-power dynamics across political systems.

Creating a COVID-19 Vaccine Donation Power Measurement

In conceptualizing a method for measuring the power generated by COVID-19 vaccine donations, this thesis adopts a deliberately constrained concept of power that privileges soft forms of attraction over the coercive concepts associated with hard power and biopolitics. Vaccine transfers are treated as voluntary gifts intended to reshape the international image of donor states and to generate long-term influence. While this is very much in line with Realism, it is used here only to measure power; this thesis does not imply that all donated vaccines were given to maximize power or that there was any lack of altruistic intent or a will for a better and healthier world. Although earlier chapters surveyed alternative understandings of power, they are not used here in order to maintain analytic focus on soft power alone. The state (e.g., nation, country) is the principal unit of analysis because it authorizes, finances, and owns many aspects of donation campaigns, even when pharmaceutical corporations manufacture them and non-governmental organizations coordinate their delivery (e.g., COVAX). States also wield the authority to block vaccine exports, underscoring their ultimate control over this resource. A secondary reason for prioritizing states is the paucity of comparable data on the soft-power effects of non-state actors. The Liberal democracy score is introduced as a key control variable on the premise that democracies and autocracies differ in their capacity to translate generosity into reputational gains. By situating the measurement within an international system that has shifted from unipolarity to a more contested multipolar configuration, the suggested method acknowledges that donors' objectives and the reception of their gestures are conditioned by broader systemic dynamics. While regional contexts undoubtedly shape perceptions, the analysis proceeds at the state level to exploit the most granular data available. Finally, because reputational dividends often materialize only with a delay, the research incorporates lagged

indicators that trace changes in a country's soft power in the years following its donations up to 2024.

Data Sources & Data Treatment

The data used to create a COVID-19 vaccine donation power measurement rely on six main sources identified in the previous chapter. First, vaccine donation records came from UNICEF's COVID-19 dashboard. UNICEF lists donor and recipient countries, delivery channels (for example, COVAX or bilateral), vaccine types, and several overlapping dose counts (Donated, Facilitated, Delivered). A single "Doses used" variable is created that takes the Delivered count when present, or else the Donated count. Donations were then summed by donor and by channel. Global case and death figures are taken from Our World in Data. The chosen cut-off date is every six months, from January 2020 through July 2024.

Political regime measures are drawn from the V-Dem Core dataset (version 15). Only the years 2019 through 2025 were kept, and two indicators were selected: the regime classification score and the liberal democracy index.

Socioeconomic context is drawn from three World Bank indicators: GDP per capita for 2019–2023 (2024 was not yet reported), total population for 2020, and land area for 2020.

The Real Instituto Elcano Global Presence Index provides country-level metrics in areas such as trade, defense cooperation, and soft power.

The Brand Finance's Global Soft Power Index is used to capture reputational and cultural dimensions.

Finally, all six sources were combined into a single primary dataset. The result is a single table ready for analysis, with full transparency in how each source was treated and merged. The full data treatment process is available in Appendix A. The descriptive statistics for this final data set are available in Appendix D.

Suggested Method for COVID-19 Vaccine Donation Power Measurement

Soft power can be measured in two main ways. The first view of soft power is as an attraction that is evident in how people judge countries. Brand Finance's Global Soft Power Index follows this perception approach. It builds a single Index score from large cross-national polls that ask about familiarity, reputation, and influence, and from evaluations across thematic pillars such as business and trade, governance, international relations, culture and heritage, media and communication, education and science, people and values, and, in recent editions, a sustainability pillar. Results are reported on a zero to one hundred scale, and country coverage has expanded from sixty in 2020 to all United Nations members by 2024.

The second treats soft power as an outward presence that can be recorded with objective statistics. The Elcano Global Presence Index takes this source-based approach. Its Soft Power component Combines the country's objective cross-border projection (not its reputation) in non-military domains, captured through ten indicators: migration (immigrant stock), tourism (non-resident arrivals), sports (Olympics + football rankings), culture (cultural goods and audiovisual services exports), information (news-agency mentions + internet bandwidth), technology (patents + IP income), science (indexed publications), education (foreign tertiary students), development cooperation (gross ODA disbursements), and climate change (GHG emissions + renewable capacity). These indicators are rescaled to a common metric, aggregated using fixed weights derived from an expert survey, and the series provides broad country coverage over a long horizon.

This thesis combines the perception-based GSPI index and the resource-based Elcano soft component into a single composite indicator. The goal is to bring together how countries are viewed and what they project abroad into a single data point. This supports testing whether COVID-19 vaccine donations are associated with changes in soft power, and it will add value to broader analyses beyond the pandemic. The theoretical gain is that it operationalizes soft power as a latent concept that links capabilities to attraction. This is also the natural bridge to Global Health Diplomacy: vaccine donations are material acts that, among other results, generate reputational dividends. A composite indicator, therefore, links the resources and perceptions

aspects of soft-power theory to a measurement strategy that tests whether health-diplomacy actions translate into measurable soft-power change. Empirically, it also reduces reliance on a single imperfect indicator and enables a single outcome variable for cross-national tests, while still allowing the two underlying dimensions to be inspected separately.

A methodological challenge follows from the different numeric scales. The GSPI index is reported on a scale from zero to one hundred, whereas the Elcano soft presence uses a much larger range. The following method will combine GSPI with Elcano, and at all stages, all 2 scores will be shown – the composite and the original two scores by GSPI and Elcano.

Principal Component Analysis (PCA) is a common statistical technique for simplifying a dataset with related variables by rotation and reduction, while preserving most of the original information. It does this by finding new axes, called principal components, which point in the directions where the data varies the most. The first component captures the largest share of variation in the data, the second captures as much as possible of what is left after the first, and so on, with the components built so they do not overlap in the information they contain (Androniceanu & Georgescu, 2021; Joint Research Centre, 2008; Jolliffe, 2011; Shlens, 2014). Additionally, principal component analysis is a common statistical method used in soft power measurements (Cevik & Padilha, 2024; Grincheva, 2022).

Soft (The Elcano Global Presence Index Soft Power component) was transformed using a log function in order to mitigate its pronounced right skew and long upper tail. The transformation compresses large values more than small ones, reducing the leverage of outliers and stabilizing variance across the range. This yields a distribution that is closer to symmetry and approximate normality. The addition of one ($1 + \dots$) to the log function serves as a safeguard, ensuring that zero-donation or zero-score cases remain in the dataset while still allowing the log transformation to be applied.

$$\text{LogSoft}_i = \ln(1 + \text{SoftScore}_i)$$

The process starts by defining the two endpoint variables. For each country i , in years $t = 2020$ and $t = 2024$ we form the two-vector:

$$\mathbf{x}_{i,t} = \begin{pmatrix} \text{IndexScore}_{i,t} \\ \ln(1 + \text{Soft}_{i,t-(t==2020?1:0)}) \end{pmatrix}$$

where we take $\text{Soft}_{i,2019}$ for $t = 2020$ and $\text{Soft}_{i,2024}$ for $t = 2024$.

Then, stacking and centering the data by pooling all $2 \times N$ observations into a data matrix

$$X = \begin{pmatrix} \mathbf{x}_{1,2020}^\top \\ \vdots \\ \mathbf{x}_{N,2020}^\top \\ \mathbf{x}_{1,2024}^\top \\ \vdots \\ \mathbf{x}_{N,2024}^\top \end{pmatrix} \in \mathbb{R}^{2N \times 2}$$

Using the Python library Sklearn PCA module, a center for each column of X is calculated by subtracting its sample mean.

Followed by computing the First Principal Component (PCA), which finds the unit-length vector $\mathbf{v} = (v_1, v_2)^\top$ that maximizes the variance captured by a one-dimensional projection of combining the two soft power measurements. This yields a single variable that preserves as much of the shared signal across both measures as possible, reducing dimensionality and potentially filtering out measure-specific fluctuations that are less likely to reflect underlying soft power:

$$\mathbf{v} = \underset{\|\mathbf{v}\|=1}{\operatorname{argmax}} \operatorname{Var}(X\mathbf{v})$$

Equivalently, $\mathbf{v}$ is the eigenvector corresponding to the largest eigenvalue of the empirical covariance matrix $\mathbf{v} = (v_1, v_2)^\top$.

$$\text{Let } \mathbf{v} = \begin{pmatrix} w_{\text{idx}} \\ w_{\text{ls}} \end{pmatrix}, \|\mathbf{v}\| = 1$$

Forming the PCA composite at each endpoint by computing for each country i (Brand Finance's Global Soft Power Index is represented as IndexScore)

$$\text{CompPCA}_{i,t} = v_1 \text{IndexScore}_{i,t} + v_2 \ln(1 + \text{Soft}_{i,t-(t==2020?1:0)})$$

In code, for $t = 2020$:

$$\text{Comp_PCA_2020}_i = w_{\text{idx}} \text{IndexScore}_{i,2020} + w_{\text{ls}} \ln(1 + \text{Soft}_{i,2019})$$

and similarly, for $t = 2024$.

Finally, the outcome of taking the five-year change:

$$\Delta \text{CompPCA}_i = \text{CompPCA}_{i,2024} - \text{CompPCA}_{i,2020}$$

This PCA composite captures the maximal shared variation in Index and log-Soft.

Initial Soft power measurement

OLS Regression 1: Δ Soft Power vs. log Doses + Economic & COVID Controls

$$\Delta Y_i = \alpha + \beta_1 \ln(1 + \widetilde{\text{TotalDoses}}_i) + \beta_2 \text{GDPpc}_{i,2019} + \beta_3 \text{Trade}_{i,2019} + \beta_4 \text{FDI}_{i,2019} + \beta_5 \text{CaseRate}_{i,2021} + \varepsilon_i,$$

	Δ GSPI Index	Δ Elcano Soft Power	Δ PCA composite
Constant	9.498***	15.310***	9.476***
(0.716)	(5.568)	(0.715)	
log(Total Doses + 1) (centered)	0.297*	4.008***	0.297*
(0.170)	(1.323)	(0.170)	
GDP per Capita (2019)	0.000	-0.000	0.000
(0.000)	(0.000)	(0.000)	
Trade (% of GDP, 2019)	-0.002	-0.022	-0.002
(0.008)	(0.060)	(0.008)	
FDI inflows (% of GDP, 2019)	0.000	-0.006	0.000
(0.039)	(0.300)	(0.039)	
Case Rate (Jan 2021)	-7.748	-107.804	-7.707
(12.217)	(94.996)	(12.198)	
Observations	48	48	48
R²	0.106	0.224	0.106
Adjusted R²	-0.001	0.131	-0.001
Residual Std. Error	2.239 (df=42)	17.409 (df=42)	2.235 (df=42)
F Statistic	0.994 (df=5; 42)	2.419* (df=5; 42)	0.993 (df=5; 42)
Note:	*p<0.1; **p<0.05; ***p<0.01		

The preliminary cross-sectional regressions of five-year changes in soft power show a positive association with vaccine donations. For both the Δ GSPI Index Score and the PCA composite, the estimated coefficient is $\beta \approx 0.29$ and statistically significant. Although this value appears small, it is important to note that donations enter log-linearly, so coefficients are compressed. For the resource-driven Elcano soft-power measure, $\beta \approx 4$ is statistically significant, indicating a much larger effect. This pattern suggests that short-term reputation gains were more limited or transitory, whereas resource-based presence shows a more persistent improvement.

To test and improve statistical accuracy, two aspects were examined. First, correlations were assessed to rule out multicollinearity. A correlation table is provided in Appendix B for this regression and subsequent regressions. Across all covariates, the maximum correlation is 0.614, which is considered reasonable for minimizing the risk of multicollinearity and biased estimates (Dormann et al., 2013). Second, a matching procedure was implemented using MatchIt (Ho et al., 2011). Although the resulting estimates were broadly consistent with the central argument of this thesis, the matching process substantially reduced the effective sample size, thereby weakening precision and the overall quality of statistical inference. In addition, covariate balance, while meeting recommended thresholds, remained sensitive to minor specification changes, indicating limited robustness. Accordingly, matching was not incorporated into the thesis's main empirical strategy, as it did not yield a sufficiently meaningful improvement in statistical validity.

Examples of Possible Additional Regressions

This thesis first assembled a robust and detailed database that combines the perception-based GSPI index and the resource-based Elcano soft-power component into a single composite indicator. It also brings together these indices with COVID-19 burden measures and COVID-19 vaccine donation data. Building this dataset is a core contribution of this thesis: it consolidates disparate sources, standardizes definitions, and produces a wide, high-quality set of observations that can support systematic empirical analysis across countries and years. This contribution also speaks directly to the literature on Global Health Diplomacy. Health diplomacy is commonly discussed as a form of soft power because it relies on cooperation, negotiation, and multi-actor

engagement, yet it is also described as smart power when health initiatives are tied to broader strategic goals and credibility claims. What is often missing, however, is a measurement strategy that can determine when medical donations translate into measurable gains and whether these gains appear primarily in reputation, outward presence, or both.

This section uses the dataset to go beyond the baseline results and to address a clear gap in the COVID-19 soft power literature. Much of the quantitative research measures short-term shifts in attraction using news tone, social media sentiment, or single-wave polls, so we still lack evidence on whether the effects of COVID-19 diplomacy persist beyond the crisis peak. On that basis, the section tests two extensions that connect to central debates in Global Health Diplomacy about credibility, cooperation, and strategic intent. First, it estimates country and year fixed-effects regressions that disaggregate donations by channel, contrasting bilateral transfers with multilateral routes, especially COVAX, in order to test whether cooperation-based delivery is associated with stronger soft-power gains than visible direct giving. Second, it examines heterogeneity across domestic institutions by incorporating baseline democracy levels and an interaction with donation intensity, motivated by the premise that reputational payoffs depend on credibility and perceived intent, which can be associated with high levels of democracy. Together, these analyses evaluate whether vaccine donations translate into measurable changes in soft power across multiple countries, years, and outcome dimensions, rather than only capturing short-lived shifts in attention or sentiment.

COVAX vs. Direct donation: A Disaggregated FE by Donation Channel

Here, the donation channel is at the heart of the hypothesis. Comparing the main ways countries donated COVID-19 vaccines matters because each channel may carry different visibility, motives, and reputational effects. A regression that separates bilateral, COVAX, multilateral, and regional donations allows us to estimate each channel's unique association with soft power while controlling disease burden ($\ln(\text{COVID-19 Cases})$), economic capacity (GDP per Capita), and the strength of the domestic COVID-19 response (COVID-19 Response). The central question is whether direct bilateral donations yield greater soft-power gains than those routed through COVAX. This matters for how IR researchers understand vaccine diplomacy as a strategic choice under conditions of crisis: if bilateral giving yields higher reputational returns,

it would suggest that states behave as credit-seeking actors who prioritize attribution and visibility even when cooperative institutions exist. Conversely, if COVAX is associated with equal or greater returns, it would indicate that multilateralism can be instrumentally rational in reputational terms and that legitimacy and cooperative signaling can outweigh the benefits of direct credit-claiming. Running the disaggregated regression is therefore essential to test which logic better explains state behavior in vaccine diplomacy and, more broadly, how states weigh cooperative constraints against reputational incentives in global health crises.

A regression is built for a fixed effect (FE) country(α_i)–year(γ_t) panel for 2020 through 2024 in order to estimate fixed effects regressions that relate several outcomes to vaccine donations disaggregated by channel, while controlling for pandemic severity and other covariates. Donation volumes are first scaled by population to obtain four per-capita regressors: bilateral, through COVAX, multilateral, and through the African Union (AU), the only regional organization that sources COVID-19 vaccine donations and discounted prices for its region. These are computed by dividing channel totals by each country's 2020 population, then carried into a multi-year analysis that also attaches the appropriate outcome measures for each year. For each analysis, the regression uses the relevant year's covariates, including the log of cumulative cases as of January of each year²⁶, GDP per capita, and an index of the official COVID-19 response from GSPI. The per-year frames are concatenated into a single panel for estimation.

Regression 2: Disaggregated Fixed Effect by Donation Channel

$$\begin{aligned}
Y_{it} = & \beta_0 + \beta_1 \text{Bilateral}_{it}^{\text{pc}} + \beta_2 \text{COVAX}_{it}^{\text{pc}} + \beta_3 \text{Multilateral}_{it}^{\text{pc}} + \beta_4 \text{AU}_{it}^{\text{pc}} \\
& + \beta_5 \ln(\text{Cases}_{it}) + \beta_6 \text{GDP}_{it}^{\text{pc}} + \beta_7 \text{Trade}_{it}^{\text{pc}} + \beta_8 \text{FDI}_{it}^{\text{pc}} \\
& + \beta_9 \text{COVIDResp}_{it} + \alpha_i + \gamma_t + \varepsilon_{it}
\end{aligned}$$

²⁶ Several alternatives exist for aggregating COVID-19 cases by year. I use the log of cumulative cases as of January of each year because start-of-year cumulative cases captures the accumulated burden countries enter the year with and offers a simple, comparable control across countries in a country–year fixed-effects design. The other covariates in the model are also measured on a yearly basis and aligned to the relevant country-year observation.

	Δ GSPI Index	Δ Elcano Soft Power	Δ PCA composite
Constant	25.740*** (2.565)	43.715*** (12.879)	0.184 (0.172)
Bilateral PC	2.840** (1.327)	1.533 (6.745)	0.092 (0.090)
COVAX PC	12.457*** (2.029)	50.549*** (11.474)	1.264*** (0.153)
Multilateral PC	-0.126*** (0.043)	-1.481*** (0.227)	-0.012*** (0.003)
ln(Cases)	-0.240* (0.142)	-1.128 (0.713)	-0.024** (0.010)
GDP per Capita	-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)
Trade (% of GDP)	-0.105*** (0.026)	-0.274** (0.131)	-0.007*** (0.002)
FDI inflows (% of GDP)	0.004 (0.004)	0.017 (0.019)	0.000 (0.000)
COVID-19 Response	3.213*** (0.273)	4.534*** (1.562)	0.196*** (0.021)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	140	135	135
R²	0.995	0.998	0.999
Adjusted R²	0.989	0.995	0.997
Residual Std. Error	1.056 (df=62)	5.274 (df=60)	0.070 (df=60)
F Statistic	161.973*** (df=77; 62)	370.525*** (df=74; 60)	600.971*** (df=74; 60)
Note:	*p<0.1; **p<0.05; ***p<0.01		

Under a country and year fixed-effects design, per-capita donations routed through COVAX show the strongest positive and statistically significant association with every soft power measurement. By contrast, bilateral donations are negatively associated with most soft power measures. Taken together, these patterns imply that COVAX not only carries a normative advantage but also aligns with the most consistent soft-power gains. This finding also fits the broader post–Cold War evolution of statecraft, in which institutional and reputational instruments become increasingly salient alongside traditional coercive and economic tools. As the international system becomes more contested, multilateral channels can shape how material contributions translate into international standing. Even if COVID-19 and “vaccine nationalism” disrupted expectations about the global order, the multilateral architecture itself remains in place, and the results suggest stronger reputational returns for donors that operate through it.

The control variables also shed some interesting light on the matter. The COVID-19 Response measures taken from the GSPI are consistently positive and highly significant. While this may not be surprising for the Δ GSPI Index fixed-effects regression, since COVID-19 Response is a component of the GSPI, it is striking that the association is also clear for the unrelated Elcano soft power measure, which is constructed independently. This suggests a possible empirical link between effective domestic health governance and soft power outcomes beyond the GSPI framework. In other words, countries that managed the crisis well may have been seen as more competent and credible, and this may have translated into stronger soft-power outcomes more broadly. At the same time, the present design cannot establish causality, but it points to a clear direction for future research that can better isolate variation in health-system performance or policy response and test whether, and through which channels, health governance translates into soft-power gains. Finally, the log of COVID-19 cases and GDP per capita do not attain conventional significance once fixed effects are included, showing that the association is not driven by how wealthy a country is or by the number of cases, but rather by how that country responded to the crisis²⁷.

Additional covariates - Liberal democracy index

This regression examines another variable, beyond COVID-19 vaccine donations, that is associated with countries' improvements in soft power. The design is motivated by the premise that soft power is the form of influence most aligned with liberal democracies and that their vaccine donations are more likely to be interpreted as altruistic, yielding larger reputational gains. The baseline liberal democracy score (2019) is included to adjust for institutional norms associated with both giving and reputation. An interaction of COVID-19 vaccine donations with the liberal democracy was added. GDP per capita (2019) score controls for the capacity to donate and the well-documented association between wealth and soft power. Early pandemic case rates (Jan 2021) capture domestic pressure that could constrain donations and shape how they are

²⁷ These effects stay the same when aggregating the donations to a single data point, with the total size of the COVID 19 vaccine donation effect, as expected, decreasing. See Appendix E for the full regression.

perceived. Conditioning on these covariates allows a focused test of the expected positive link between donation volume and reputational gains. This extended regression was run as HC3 heteroskedasticity-consistent (a method used when the regression errors are suspected to have non-constant variance across observations, to ensure valid standard errors and inference; and is a known tool in IR research (Mansfield et al., 2000; Reuveny & Li, 2003)) with centered interaction for robust standard errors and reduced multicollinearity.

Regression 3: Additional covariates - Liberal democracy index

$$Y_i = \alpha + \beta_1 \log(\tilde{\text{Doses}}_i + 1) + \beta_2 \tilde{\text{LibDem}}_i + \beta_3 (\log(\tilde{\text{Doses}}_i + 1) \cdot \tilde{\text{LibDem}}_i) + \gamma_1 \text{GDPpc}_{i,2019} + \gamma_2 \text{Trade}_{i,2019} + \gamma_3 \text{FDI}_{i,2019} + \gamma_4 \text{CaseRate}_{i,2021} + \varepsilon_i$$

	Δ GSPI Index	Δ Elcano Soft Power	Δ PCA composite
Constant	8.319***	10.973	0.250
	(0.761)	(7.604)	(0.373)
log(Total Doses + 1) (centered)	0.473***	4.052	0.284**
	(0.157)	(2.933)	(0.126)
Liberal Democracy (2019, centered)	-5.417***	-30.173	-2.515**
	(1.990)	(28.024)	(1.223)
Interaction: log(Doses) × Liberal Democracy	-0.107	-15.865	-0.745
	(0.450)	(17.522)	(0.755)
GDP per Capita (2019)	0.000*	0.000	0.000**
	(0.000)	(0.000)	(0.000)
Trade (% of GDP, 2019)	-0.007	-0.050	-0.004
	(0.007)	(0.049)	(0.003)
FDI inflows (% of GDP, 2019)	0.001	-0.118	-0.005
	(0.013)	(0.279)	(0.013)
Case Rate (Jan 2021)	8.577	-38.018	8.590
	(18.076)	(57.719)	(18.066)
Observations	48	48	48
R²	0.398	0.544	0.611
Adjusted R²	0.293	0.464	0.543
Residual Std. Error	1.882 (df=40)	13.673 (df=40)	0.737 (df=40)
F Statistic	3.495*** (df=7; 40)	1.001 (df=7; 40)	5.015*** (df=7; 40)
Note:	*p<0.1; **p<0.05; ***p<0.01		

The estimates indicate a robust, positive correlation between COVID-19 vaccine donation volume and reputational gains on the GSPI Index and on the PCA composite. The coefficient on log(Total Doses + 1) is 0.473 and 0.284 for the ΔGSPI Index and ΔPCA composite (p < 0.01 and p < 0.05). By contrast, the Elcano Soft Power outcome exhibits imprecise estimates: the donation

coefficient is not significant, indicating insufficient precision to draw firm conclusions for Soft under this specification.

Turning to democracy, the centered 2019 liberal-democracy score shows a negative and statistically significant main effect for the GSPI Index and PCA composite (-5.41 and -2.515 , $p < 0.01$ and $p < 0.05$), suggesting that, on average, donation intensity in more liberal democracies tends to realize smaller gains. This pattern is consistent with a possible glass-ceiling interpretation, which is tested below. Accordingly, the hypothesis that countries with higher liberal-democracy scores gain more soft power from vaccine donations is not supported by this data, implying that, on average, donation intensity in more liberal democracies tended to realize smaller gains, a pattern consistent with a possible glass ceiling effect. The interaction between donations and democracy is small and statistically indistinct, and therefore, the hypothesis that countries with high liberal-democracy scores will gain more soft power from donations is not supported by this data. Finally, the model fit suggests that the regression covariates do not fully capture the reasons for soft power gains during the COVID-19 pandemic.

To test whether observed soft-power changes reflect a “glass ceiling” mechanism, baseline-dependence tests are applied. The glass-ceiling hypothesis implies diminishing returns near the top of the distribution: countries that begin at higher baseline levels should exhibit smaller proportional gains, even if absolute point gains remain possible. For each outcome, the change score is regressed on the baseline level of the same measure using OLS with HC3 heteroskedasticity-robust standard errors. Both absolute-change models (Δ outcome from baseline) and log-change models (log difference from baseline) are estimated, with the log difference approximating proportional change.

Baseline Dependence & Ceiling Test (HC3)

Model	Baseline level	Constant	N	R²
GSPI: Δ Index	0.0882*** (0.0246)	5.3861*** (1.0587)	60	0.141
GSPI: log change	-0.0022*** (0.0005)	0.2928*** (0.0231)	60	0.198
Elcano: Δ Soft	0.1724* (0.1022)	-1.2875 (1.4988)	149	0.644
Elcano: log(1+Soft)	0.0003* (0.0002)	0.0537*** (0.0105)	149	0.020

The baseline-dependence tests reveal distinct dynamics across the two measurement frameworks. In GSPI, baseline soft power is positively associated with absolute point gains but negatively associated with proportional gains, which is consistent with a glass-ceiling mechanism in a bounded perception index: countries starting at higher perception levels show smaller percentage improvements. In contrast, Elcano Soft measurement exhibits strong baseline dependence in absolute change but no comparable negative relationship in proportional change, indicating scale dependence rather than a glass ceiling. Overall, the evidence supports a glass-ceiling interpretation of the GSPI perception measures but not of the resource-based Elcano presence measure.

The analysis suggests that health diplomacy is more closely associated with changes in perception-based soft power than with changes in resource-based presence. At the same time, GSPI outcomes exhibit ceiling dynamics, implying diminishing proportional gains for countries that begin at high reputation levels. This pattern cautions against interpreting raw change scores as uniform ‘returns’ to diplomacy across countries and highlights the value of using both absolute and proportional change specifications. Overall, vaccine donations appear to operate primarily through reputational channels in this dataset, while resource-based presence measures capture slower-moving structural dynamics.

Discussion

This chapter set out to devise and test a measurement of COVID-19 vaccine donation soft power, grounded in the best available data. This was done in three stages. First, a critical review of the COVID-19 soft-power literature revealed that most research on the topic is limited to perception studies: content analyses of news coverage, sentiment mining of social media posts, and single-wave or country-specific surveys. These works shed light on momentary changes in reputation, especially for China, the United States, and a handful of other states, yet they lacked a global view and did not connect perceptions to longer-term outcomes. The review underscored the need for a wider, global view and for a longer time frame analysis.

Second, the chapter surveyed ten soft power indexes. Most proved unsuitable: several have lapsed, others cover only narrow regions, and many fail to report consistent time series. Two stood out as both methodologically transparent and broadly comparable across more than one hundred states. The Elcano Global Presence Index supplies an objective, resource-based view of soft power, whereas Brand Finance's Global Soft Power Index offers a perception-based view of soft power. Combining these two perspectives requires a principled statistical tool; therefore, Principal Component Analysis (PCA) was used. Before that step, however, an original dataset had to be assembled. The new dataset merges 1) donations data from UNICEF, 2) pandemic severity indicators from WHO, 3) socioeconomic context from the World Bank, and 4) regime characteristics from V-Dem, all keyed to ISO-3166 codes and fully documented in reproducible code. This dataset, spanning 2019 to 2024, is an independent contribution to academic research and a unique resource in its own right.

Third, the chapter operationalized soft power measurement of COVID-19 vaccine donations by examining changes between 2020 and 2024 in each index and in their PCA composite, and relating these changes to logged totals of donated vaccine doses. A naïve OLS regression indicated statistically significant positive associations for this measurement. Fixed-effects panels disaggregated by donation channel (such as COVAX and direct donations) showed that doses delivered through COVAX had the strongest positive effect, whereas bilateral transfers had a weak negative effect. Supplementary models that introduced Liberal democracy scores, GDP per capita, and early pandemic case rates did not overturn the core donation coefficient; indeed, the democracy main effect was negative, suggesting a possible ceiling for already well-regarded states.

Several caveats should be mentioned at this stage. First, Exogenous shocks such as the 2022 Russian invasion of Ukraine were not modelled. Second, while the regression shows the expected correlation between donations and soft power, its overall explanatory power remains low. Third, the analysis treats all vaccine brands as equivalent, despite differences in quality between vaccines. This shortcoming is necessitated by the scope of this thesis. However, for future research, fine-grained data by vaccine type does exist. Fourth, domestic political cycles (such as the 2024 US elections), and proxied measures of donors' strategic incentives, including

indicators commonly used to capture expectations of immediate “hard” political returns (such as expanded bilateral ties, UN voting alignment, or other tangible diplomatic concessions) and broader quid pro quo dynamics, were not incorporated. Fifth, while there has been much effort to lay out the causation reasoning behind the measurements and regressions, they nonetheless only report correlations, not causation.

These regressions and data measurement demonstrate that a combined perception–resource metric is empirically tractable and that vaccine diplomacy shows systematic links to soft power change when measured on a global scope. The practical implications are twofold. First, the dataset and code provide a transparent foundation for future academic research, whether that work refines the regressions reviewed in this thesis, or explores new avenues. Second, the preliminary regressions suggest that donating through COVAX may yield reputational dividends beyond those available through bilateral channels, an insight that warrants deeper investigation and may influence decisions on future medical donations.

In sum, this chapter offers the first comprehensive mapping of COVID-19 soft-power research; a systematic review of existing soft power indexes; a new, combined dataset covering donations, pandemic data, Liberal democracy level, and two complementary soft power measurements of resources & perception; and an initial empirical test that establishes both the promise and the limits of the proposed soft power measurement of COVID-19 vaccine donations. The results invite further research, but they also demonstrate that the soft power consequences of health diplomacy can be analyzed at a global scale during crises, combining both perception and resources within an analytical framework.

Conclusion

This thesis set out to determine how to measure the effect of COVID-19 vaccine donations on soft power gains. It first positioned vaccine donations within the field of Global Health Diplomacy and then addressed the persistent challenge of measurement by selecting two complementary indicators of soft power: the perception-based Brand Finance Global Soft Power Index (GSPI) and the outcome-based Elcano Global Presence Index's soft component. On that conceptual foundation, it developed a composite indicator and an empirical strategy to test multinational aspects beyond single-country case studies. In doing so, the study addressed a clear gap in the literature and advanced a comparative, global lens on pandemic-era COVID-19 donations as a component of soft power.

A second core contribution was the empirical infrastructure. A global dataset was assembled that unifies the two soft power measures, the composite soft power indicator, and a range of covariates related to the pandemic, the Liberal Democracy level, economics, and others. This integrated resource was designed not only to test the main question about vaccine donations but also to support further analyses of the effects of regime type and donation channel.

The results provide statistically significant evidence that vaccine donations were associated with soft power gains for donors. Disaggregating by route clarifies the mechanism. When country and year fixed effects are included, per-capita donations routed through COVAX show the strongest positive, statistically significant association across all soft power measurements, whereas bilateral donations are weak or negative for most measures. Additionally, the GSPI "COVID-19 Response" indicator of domestic management of COVID-19 is also statistically significant and positive, suggesting that competent crisis governance has soft power gains. These findings imply that being a "good citizen of the world" is not only normatively correct, but it also appears to be more effective for soft power gains.

These contributions must be interpreted with appropriate caution. The study's strategy identifies robust associations rather than definitive causal effects. Endogeneity remains a risk when more capable or internationally oriented states are simultaneously more likely to donate and to be

perceived favorably. For this reason, the thesis framed the extended analyses as initial indicators and positioned the dataset as an invitation to further investigate these areas of research.

In sum, the five chapters together deliver a coherent arc: from the pandemic context and the evolution of power concepts, through a structured review of soft power measurements, to a practical global dataset that makes the consequences of vaccine donations observable. The evidence points to measurable soft-power gains for donors, especially when giving through COVAX, and highlights the value of effective domestic pandemic response. The broader implication is that crisis-time cooperation can be both morally imperative and strategically rewarding when channeled through credible multilateral architectures. The measurement tools, data resources, and initial empirical results presented here are intended to catalyze further research into how health diplomacy converts into soft power that endures beyond the emergency itself.

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Appendices

Appendix A – Data Sources & Data Treatment

The data used to construct the COVID-19 vaccine donation power measure comes from six main sources identified in the previous chapter, which are standardized and then combined into a single final table. First, vaccine donation records come from UNICEF’s COVID-19 dashboard, and specifically the internal CSV it is based on. These files list donor and recipient countries, delivery channels (for example, COVAX or bilateral), vaccine types, and several overlapping dose counts (Donated, Facilitated, Delivered). A single “Doses used” variable is created that takes the Delivered count when present, or else the Donated count. Donations are then summed by donor and by channel, and a total is added. Country names are converted to standard ISO 3166 forms using the pycountry Python library, with the addition of a small manual lookup table where the library is not sufficient. Any entries that do not match a recognized state are reported and then removed.

Global case and death figures come from Our World in Data’s full_data.csv stored in Our World in Data’s GitHub repository. The cutoff dates are chosen to be every six months from January 2020 through July 2024. For each country, the latest total up to each cutoff is selected, and the data are reshaped so that each date’s cases and deaths become their own columns. Country labels are standardized in the same way as for the vaccine data. Non-sovereign aggregates (such as “World” or income-group totals) are filtered out to leave only states.

Political regime measures come from the V-Dem Core dataset (version 15). Only the years 2019 through 2025 are kept, and two indicators are selected: the regime classification score and the liberal democracy index. These are pivoted so that each year’s score becomes its own column. After matching country names to ISO 3166 forms and removing any duplicates, only Kosovo is dropped as the only non-standard entry.

Socioeconomic context comes from three World Bank indicators accessed via the Data360 API: GDP per capita for 2019–2023 (2024 is not reported yet), total population for 2020, Trade 2019 (% of GDP), FDI inflows 2019 (% of GDP), and land area for 2020. Each JSON response is parsed

into a small table of ISO3 codes, country names, and values. The tables are merged using ISO3 (ISO 3166), and any missing country names are filled via pycountry lookups. Any remaining non-standard codes are dropped.

The Real Instituto Elcano Global Presence Index is retrieved through its REST API for 2019–2024. Each year’s data reports country-level metrics in areas such as trade, defense cooperation, and soft presence. The redundant year column is removed, the year is appended to each metric name, and all years are joined together on country. A final pass matches country names to ISO 3166 forms and drops entities that do not match ISO 3166 from the list.

To capture reputational and cultural dimensions, Brand Finance’s Global Soft Power Index is used. This soft power index includes a publicly available PDF summary report. PDFs are widely recognized as a poor format for sharing tabular data. Nonetheless, the PDF reports are converted to CSV using either the tabula Python library or a workflow that uses pdf2docx with the docx library to convert the PDF to a DOCX and extract tables in a more accessible format. The resulting tables are cleaned to enforce consistent column names and numeric types.

Finally, all six tables are combined into one primary dataset using an outer join with the country identifier as the key. Extra and duplicate fields are removed, and all variables other than the identifiers (ISO3 ISO 3166 code, country name, region) are converted into numeric form, with dash placeholders converted into missing values. The result is a single table ready for analysis, with full transparency in how each source is treated and merged. The descriptive statistics for this final dataset are available in Appendix D.

Appendix B – Correlation Tables for OLS Regressions

Regression 1

	log_doses_c	gdp_pc_2019	case_rate_2021	trade_2019	fdi_2019
log_doses_c	1.000	0.265	0.041	-0.067	-0.129
gdp_pc_2019	0.265	1.000	0.137	0.493	-0.016
case_rate_2021	0.041	0.137	1.000	0.082	-0.029
trade_2019	-0.067	0.493	0.082	1.000	0.407
fdi_2019	-0.129	-0.016	-0.029	0.407	1.000

Regression 2

	bilateral _pc	covax _pc	multilater al_pc	au_ pc	ln_ca ses	gdp_ pc	tra de	fdi	covid_r esp
bilateral_p c	1.000	0.095	0.055	- 0.08 3	-0.082	0.194	0.13 4	0.0 91	0.197
covax_pc	0.095	1.000	0.023	- 0.08 6	0.238	0.614	0.16 4	- 0.1 38	0.334
multilater al_pc	0.055	0.023	1.000	- 0.01 4	0.037	- 0.030	- 0.01 9	0.0 08	0.013
au_pc	-0.083	-0.086	-0.014	1.00 0	0.065	- 0.105	- 0.07 9	0.0 14	-0.090
ln_cases	-0.082	0.238	0.037	0.06 5	1.000	- 0.053	- 0.14 9	- 0.0 03	-0.034

gdp_pc	0.194	0.614	-0.030	- 0.10 5	-0.053	1.000	0.45 4	- 0.2 23	0.577
trade	0.134	0.164	-0.019	- 0.07 9	-0.149	0.454	1.00 0	- 0.2 39	0.162
fdi	0.091	-0.138	0.008	0.01 4	-0.003	- 0.223	- 0.23 9	1.0 00	0.002
covid_resp	0.197	0.334	0.013	- 0.09 0	-0.034	0.577	0.16 2	0.0 02	1.000

Regression 3

	log_doses _c	libdem_2019 _c	gdp_pc_20 19	trade_20 19	fdi_20 19	case_rate_2 021
log_doses_c	1.000	0.383	0.265	-0.067	-0.129	0.041
libdem_2019 _c	0.383	1.000	0.507	0.091	-0.105	0.358
gdp_pc_201 9	0.265	0.507	1.000	0.493	-0.016	0.137
trade_2019	-0.067	0.091	0.493	1.000	0.407	0.082
fdi_2019	-0.129	-0.105	-0.016	0.407	1.000	-0.029
case_rate_2 021	0.041	0.358	0.137	0.082	-0.029	1.000

Summary Table

Model	Max_abs_corr	Num_pairs_ corr >=0.68
Reg 1	0.493272	0
Reg 2	0.614148	0
Reg	0.507346	0

Appendix C – Summarized List of Quantitative Research Related to COVID-19 Power Measurements

Author (Year)	Countries assessed for potential soft-power gain	Audience countries where perspective was measured	COVID-19 dimension examined	Empirical gauge of soft power
Chen (2023)	China	Italy	“Mask diplomacy” (medical-supply donations, Mar– Apr 2020)	Computer-assisted content analysis of seven high-circulation newspapers (reference volume + tonal valence)
Kim et al. (2023)	China	English- language press in multiple countries	Early pandemic news framing (Dec 2019–Jul 2020)	Google NL API sentiment scores, Savitzky–Golay smoothing, Dirichlet- Multinomial topic modelling of 8,082 headlines
Lee (2021)	China	Global social- media users and international news outlets	Vaccine diplomacy (Jul 2020–Mar 2021)	Social Studio sentiment on 41,233 posts; Leximancer concept- sentiment mapping of 57,866 news items

Lee & Kim (2020)	South Korea	Worldwide news and social-media discourse	Crisis-response model (testing & tracing, Jan–Jun 2020)	Leximancer sentiment of 8,318 news items; Social Studio sentiment of 32,849 posts
Gill (2020)	China (pre-COVID baseline)	Cross-national respondents (Pew, Gallup, Lowy, ASEAN)	General international reputation	Aggregation of polling series into the Soft Power 30 index
Lin & Meng (2024)	United States; China	South Korea, Japan, Singapore, Hong Kong	Competing pandemic strategies (mitigation vs zero-COVID)	Two-wave online panel survey (May 2020, Jun 2021)
Cho et al. (2020)	South Korea	Sixteen European states (expert panels)	Pandemic governance image	Questionnaire to 23 Korea specialists
van Dijk & Lo (2023)	China	Philippines, Vietnam	Sinopharm/Sinovac exports & donations	Deductive thematic analysis of 63 documents + 5 opinion-poll datasets
Zubair et al. (2023)	China	Thirty European countries; global digital audience	Vaccine diplomacy and “wolf-warrior” messaging	Global Soft Power Index; CEIAS regional poll; CSIS China-Power digital-engagement metrics
Li et al. (2025)	China	Thailand, Philippines	Donations of masks, PPE and Sinovac	Repeated cross-section ASEAN “State of Southeast Asia” surveys (2021, 2023)

Zhai (2025)	United States	China, Japan, South Korea	Crisis-management competence & cooperation	Cross-national web survey (Jan–Feb 2022)
Urdínez (2024)	China; United States	Argentina, Brazil, Chile, Colombia, Mexico, Peru	Vaccine & medical- supply provision	Two-wave panel survey, survey experiment, municipality-level donation data
Thomas et al. (2025)	China; United States	Twelve OECD societies	Overall favourability during pandemic	Quasi-experimental time-series with Pew Global Attitudes
Pisarska (2020)	United States; China; Germany; South Korea	Comparative global reputation	Domestic crisis management, diplomacy, business innovation	Three elements adapted from the Monocle Soft- Power Index
Barham et al. (2022)	Vaccine- origin countries (various)	Six Latin- American states	Trust effects of vaccination source	Two-wave panel survey of vaccinated adults
Nolte (2023)	China	Latin America	Mask & vaccine diplomacy (2020-21)	Shipment/donation database; regional polls; paired-wave survey experiments; 28-month Twitter sentiment series

Nagao et al. (2025)	South Africa; China; United States	Zimbabwe	Country-of-origin effect on vaccine acceptance	Randomized online survey experiment (March 2023)
Frade et al. (2025)	USA, Germany, UK, China, Russia, local producers	Forty-eight countries (systematic review)	Public willingness to accept vaccines by provenance	Meta-analysis of 52 quantitative COO studies

Appendix D – Descriptive Statistics for Final Data Set

	N	Missing	Mean	Std	Min	25%	50%	75%	Max
total_cases_2021-01	224	3	928757.326	5108126.24	0.0	1952.5	24585.5	213783.75	54123948.0
Index Score_2020	60	167	40.755	10.195	27.5	31.85	38.95	47.625	67.1
Index Score 2021	105	122	36.766	9.345	25.2	29.8	33.4	42.3	62.2
COVID-19 Response_2021	105	122	3.436	1.049	1.2	2.8	3.3	3.9	5.9
Index Score 2022	120	107	37.207	10.204	25.3	29.975	33.05	41.675	70.7
COVID-19 Response_2022	120	107	4.047	1.064	1.9	3.3	3.75	4.525	6.5
Index Score 2023	121	106	42.0	8.802	32.7	35.6	38.7	46.2	74.8
Index Score 2024	175	52	38.59	11.066	25.7	30.8	34.9	42.8	78.8
Index Score 2025	193	34	36.838	12.088	18.8	29.0	33.6	40.8	79.5
Total Doses	89	138	18180785.876	77626078.393	200	17000	19000	61176	696916480.0
Bilateral	89	138	5326233.629	20484088.806	0.0	10000	60000	34243	173458340.0
Multilateral	89	138	4495.955	42414.755	0.0	0.0	0.0	0.0	400140.0

Through African Union	89	138	842.697	7949.984	0.0	0.0	0.0	0.0	75000.0
Through COVAX	89	138	12849213.596	67407376.673	0.0	0.0	0.0	2544400.0	616927660.0
Liberal democracy index_2019	172	55	0.415	0.266	0.009	0.158	0.407	0.632	0.889
Liberal democracy index_2020	172	55	0.41	0.265	0.01	0.156	0.402	0.649	0.886
Liberal democracy index_2021	172	55	0.402	0.266	0.011	0.131	0.398	0.641	0.887
Liberal democracy index_2022	172	55	0.398	0.268	0.012	0.135	0.388	0.651	0.89
Liberal democracy index_2023	172	55	0.394	0.268	0.01	0.126	0.372	0.636	0.884
Liberal democracy index_2024	172	55	0.387	0.267	0.009	0.126	0.368	0.621	0.883
Regimes of the World classification_2019	172	55	1.669	0.968	0.0	1.0	2.0	2.0	3.0

Regimes of the World classification_2020	172	55	1.64	0.96	0.0	1.0	2.0	2.0	3.0
Regimes of the World classification_2021	172	55	1.605	0.983	0.0	1.0	2.0	2.0	3.0
Regimes of the World classification_2022	172	55	1.564	1.01	0.0	1.0	2.0	2.0	3.0
Regimes of the World classification_2023	172	55	1.547	0.999	0.0	1.0	2.0	2.0	4.0
Regimes of the World classification_2024	172	55	1.512	1.0	0.0	1.0	2.0	2.0	4.0
gdp_per_capita_2019	205	22	18346.74 4	27148 .535	210. 236	2225. 88	6837. 77	24021. 3	193747. 0
gdp_per_capita_2020	204	23	17154.56 8	26032 .794	210. 008	2176. 602	6433. 085	21134. 575	176892. 0
gdp_per_capita_2021	204	23	19813.41 5	30769 .72	214. 091	2476. 132	7054. 635	24128. 9	223823. 0
gdp_per_capita_2022	201	26	20055.25 7	30748 .215	250. 634	2389. 74	7589. 3	24620. 5	226052. 0
gdp_per_capita_2023	190	37	19968.03 9	30292 .908	193. 007	2478. 682	7811. 535	24319. 55	256581. 0
population_2020	211	16	37444336 .645	14209 6486. 155	103 99.0	10100 76.5	69340 20.0	27327 350.0	141110 0000.0

land_area_sq_km	211	16	619293.2	17687	2.02	12820	10083	47132	163769
_2020			85	22.25	7	.0	0.0	0.0	00.0
				5					
Soft_2019	149	78	21.518	51.29	0.45	1.775	4.31	15.694	419.546
				8	8				
Soft_2020	149	78	22.088	53.39	0.44	1.783	4.619	16.481	446.726
				8	2				
Soft_2021	149	78	20.885	51.89	0.47	1.659	3.996	15.593	449.018
				6	7				
Soft_2022	149	78	22.861	57.47	0.46	1.699	4.342	16.402	506.654
				6	1				
Soft_2023	149	78	23.64	59.52	0.49	1.781	4.682	17.282	537.292
				6	9				
Soft_2024	149	78	23.939	60.49	0.52	1.91	4.781	18.123	547.19
				9	1				

The full descriptive statistics of this data set, including data points not used in this thesis, can be found here: <https://github.com/HananelLivneh/Soft-Power-Measurement-of-COVID-19-Vaccine-Donations/tree/main>

Appendix E – Country Fixed-Effects Panel Regression

$$Y_{it} = \beta_0 + \beta_1 \ln(\text{Cases}_{it}) + \beta_2 \text{GDPpc}_{it} + \beta_3 \text{COVIDResp}_{it} + \beta_3 \text{DonationsPC}_{it} + \alpha_i + \gamma_t + \varepsilon_{it}$$

Where:

- α_i are country fixed effects
- γ_t are year fixed effects

Country & Time Fixed-Effects (with Donations)

	IndexScore FE	Soft FE	Comp_PCA FE
Constant	16.684***	19.801**	18.386***
	(1.642)	(7.888)	(1.657)
ln(Cases)	-0.168	-0.921	-0.179
	(0.156)	(0.716)	(0.150)
Vax Donations per Capita	5.716***	23.210***	5.233***
	(1.529)	(7.421)	(1.559)
GDP per Capita	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
COVID-19 Response	3.395***	5.090***	2.988***
	(0.292)	(1.538)	(0.323)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	143	137	137
R2	0.994	0.998	0.994
Adjusted R2	0.987	0.995	0.987
Residual Std. Error	1.166 (df=65)	5.350 (df=63)	1.124 (df=63)
F Statistic	138.524*** (df=77; 65)	366.522*** (df=73; 63)	144.692*** (df=73; 63)
Note:	*p<0.1; **p<0.05; ***p<0.01		

Appendix F – Python Code

Full code is available in digital appendix here:

<https://github.com/HananelLivneh/Soft-Power-Measurement-of-COVID-19-Vaccine-Donations/tree/main>

Appendix G – Soft Power Indexes Summary

Index (Author / Publisher)	Publication span	Geographic coverage	Data orientation & main pillars	Major strengths	Principal limitations	COVID-19 relevance	Suitability for thesis
Portland Soft Power 30	2015 – 2019	Top 30 states only	65 % objective indicators + 35 % multi-country opinion poll	Transparent mix of resources + perceptions; rich 75-indicator set, widely cited, endorsed by Nye	Ends in 2019; sample restricted to wealthy Western democracies, online survey bias	No pandemic coverage (series stop before 2020)	Excluded (lacks COVID period and broad coverage)
Monocle Soft Power Survey	2010 – 2023	25 states per edition	Generalized list of ad-hoc statistics + editorial judgments, no clear fixed framework	One of the first indexes, colorful narrative appeal	No definition or methodology, inconsistent metrics, strong Western bias	No systematic COVID metrics	Excluded (non-replicable, light indicators)

Lowy Institute Asia Power Index	since 2018	27 Asia-Pacific states	131 indicators in 8 themes (mix of hard & soft), minor role for Cultural Influence	Transparent weights, online re-weighting tool, COVID-specific indicators (2020-21)	Subjective theme weights, Asia-only scope, some proxy indicators	Added pandemic & vaccine-diplomacy metrics 2020-21	Conceptual reference only (regional scope too narrow)
Anholt-Ipsos Nation Brands Index	since 2008	60 rated states, 20 survey markets	Perception survey, six equal dimensions: Exports, Governance, Culture, People, Tourism, Investment & Immigration	Long time-series, rigorous quotas, influential with policymakers	Online-only samples, limited respondent geography, proprietary microdata, no causal insight	No dedicated COVID items, pandemic effects inferred indirectly	Excluded (access & scope constraints)
ISSF World Soft Power Index	First 2022, fuller 2023	Top 25 only (scores withheld)	Twin perception surveys + objective stats, two broad	Attempts to link soft power to	Omits survey size, weights, a	Includes the COVID-19 aid indicator, but	Excluded (insufficient transparency)

			pillars (economic-political, social-cultural)	geopolitics & COVID-19 aid	narrow list, and non-transparent	the data is unclear	
Elcano Global Presence Index (IEPG)	Annual since 2010 (data back to 1990)	150 states by 2025	Purely objective flows, 16 indicators (5 economic, 2 military, 9 soft presence: migration, tourism, culture, sport, information, tech, science, education, aid)	Open dataset & code; long series, nearly universal coverage	Measures presence, not persuasion (no perceptions), two-year data lag	Captures pandemic shocks	Primary resource indicator
Pew Global Attitudes Survey	Since 2001 (almost yearly)	110 states cumulative, variable per wave	Nationally representative opinion polls on foreign views & issues	Methodologically sound, open datasets, flexible topical modules	Coverage varies annually, not a composite index, and there are large gaps for some states	Multiple COVID-19 surveys on China, the US, vaccines, etc.	Excluded (not a complete index)

IMF Working-Paper Global Soft Power Index (Cevik & Padilha)	One-off 2024 (data 1990-2021)	66 states	29 indicators in six dimensions	Long span, clear construction steps	Prototype; stops at 2021, dataset not public, limited	Covers the first pandemic year only	Excluded (work-in-progress, no dataset)
Brand Finance Global Soft Power Index (GSPI)	Since 2020	Expanded from 60 to all 193 UN members	Large-sample polls of familiarity, reputation, influence + 7 (/8) thematic pillars (+ recommendation module)	Unrivalled global perception coverage; regression-based weights, detailed attributes	No pre-2020 baseline; early waves miss many mid-income states, micro-data pay-walled	One-off pandemic response item (2021) + indirect effects in pillars	Primary perception index
FutureBrand Country Index / Country Brand Index	Editions 2005-14 (CBI), 2014, 2019, 2020 (FCI)	75 largest economies	~2,500 frequent-traveler poll, six brand-associations grouped into	Links brand theory to the nation image, qualitative insights	Small expert sample; proprietary model; infrequent	Last issue 2020, only an early-COVID snapshot	Excluded (limited coverage & cadence)

			Purpose & Experience		editions; size- based roster		
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