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Vaccine Equity: Mapping the Challenges

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Key Points:

- Procurement and licensing have been the primary market schemes through which the COVID-19 pandemic vaccines can be purchased. Yet access to the vaccines is often unbalanced across the globe due to political considerations. The recent dispute between the Taiwan Centers for Disease Control and Shanghai Fosun Pharma over the procurement of Pfizer-BioNTech vaccines illustrates one such worrying trend.
- The multilateral platform of COVAX continues to be undermined by vaccine nationalism and competition of bilateral deals from wealthy countries over vaccine doses. While cross-border licensing can help enhance the capacity of vaccine production and the performance of the global supply chain, it faces nationalist challenges such as restrictions on vaccine exports.

Introduction

As the COVID-19 pandemic continues to spread across the globe, there is urgent need to develop

and distribute effective vaccines to ensure people in all countries have fair and equitable access to vaccines. Bilateral and multilateral procurement schemes are currently the main mechanisms through which COVID-19 vaccines can be acquired. To enhance the capacity of vaccine production and the performance of the supply chain, major pharmaceutical companies such as AstraZeneca, BioNTech, and Sinovac have also attempted to arrange outsourcing measures, such as licensing and “original equipment manufacturing.”¹ But in practice, as this Research Brief will illustrate and explain, the operation of these schemes so far has failed to meet the significant political challenges to global vaccine equity.

The Politics of Vaccine Procurement

Access to COVID-19 vaccines is highly vulnerable to geopolitical considerations. The recent dispute between Shanghai Fosun Pharmaceutical (Group) Co., Ltd. (hereinafter, “Fosun Pharma”), the company that BioNTech has contracted to distribute vaccines in Greater China, and the Taiwan Centers for Disease Control over the procurement of Pfizer-BioNTech vaccines provides one such example. Both parties seem to

¹ Weiduo Shen & Shumei Leng, *Chinese COVID-19 Vaccine Producers Mull Technology Transfer to Tackle Global*

Vaccine Inequalities, GLOBAL TIMES (Apr. 20, 2021), <https://www.globaltimes.cn/page/202104/1221614.shtml>.

have weaponized the process of vaccine procurement for political ends, allowing the domestic politics within which they are embedded to override international health security.

As Taiwan continues to receive AstraZeneca and Moderna vaccines from Japan and the US since the pandemic outbreak in May 2021,² it failed to secure a single dose of the German BioNTech vaccines for months. The Taiwanese authority attributed this difficulty to Fosun Pharma's politicization of its exclusive rights during the procurement negotiation.³ While it is not surprising that the company may want to domesticize Taiwan's vaccine procurement processes to align with the PRC's "One China" policy by, for instance, requiring the Taiwanese authority to name itself as "Taiwan" rather than as a "country" in the contract,⁴ there remain suspicions that the Taiwanese authority has intentionally exploited the vaccine quarrel for political gain, such as to mobilize nationalist resentment against China.⁵

Problems attendant to the deal with Fosun Pharma are also compounded by Taiwan's own domestic politico-economic considerations.⁶ For one thing, there is widespread distrust of the Chinese-distributed vaccine among the Taiwanese public.⁷ A foreign vaccine manufactured in China, such as the Fosun/BioNTech vaccine, which the company rebranded as "Comirnaty" (复必泰), prompts speculation about whether the vaccine to be delivered by Fosun Pharma is identical to BioNTech vaccines imported directly from Germany.⁸ For another, there has been a political push for domestic vaccines that seems to have slowed down the government's procurement process for foreign vaccines.⁹ As the Chinese media points out, it is unclear whether the current Taiwan authority genuinely welcomes vaccine imports, since such a move may threaten the commercial prospect of its own locally developed vaccines.¹⁰

The Taiwanese government has taken a tough stance, insisting that Taiwan should only be contracted as a sovereign entity with Fosun

² See Erin Hale, "Preventing Fatigue" Driving Sudden COVID Surge in Taiwan: Expert, AL JAZEERA (June 9, 2021), <https://www.aljazeera.com/news/2021/6/9/prevention-fatigue-fuelled-sudden-covid-surge-in-taiwan-expert>; Nick Aspinwall, *Taiwan Receives Vaccine Donation from Japan as Outbreak Continues*, THE DIPLOMAT (June 5, 2021), <https://thediplomat.com/2021/06/taiwan-receives-vaccine-donation-from-japan-as-outbreak-continues/>; AP News, *U.S. Sends Taiwan 2.5 Million Vaccine Doses*, TIME (June 20, 2021), <https://time.com/6074433/us-taiwan-covid-19/>.

³ Keoni Everington, *Chinese Executive Allegedly Blocked Taiwan's Purchase of BioNTech Vaccines*, TAIWAN NEWS (June 21, 2021), <https://www.taiwannews.com.tw/en/news/4228761>.

⁴ Raymond Zhong & Christopher F. Schuetze, *Taiwan Wants German Vaccines. China May Be Standing in Its Way*, N.Y. TIMES (June 16, 2021), <https://www.nytimes.com/2021/06/16/business/taiwan-china-biontech-vaccine.html>; Kelvin Chen, *German Health Expert Blames Politics for Taiwan Failure to Acquire BioNTech Vaccines*, TAIWAN NEWS (June 4, 2021), <https://www.taiwannews.com.tw/en/news/4215695>; Sherry Hsiao, et al., *BioNTech Asked to Cut "Country": Chen*, TAIPEI TIMES (May 28, 2021), <https://www.taipeitimes.com/News/front/archives/2021/05/28/2003758178>.

⁵ See e.g., GT Staff Reporters, *DPP's Politicizing of Vaccine Imports Meets Fierce Rebuke from Taiwan Business Leaders*

Based in Chinese Mainland, GLOBAL TIMES (May 24, 2021), <https://www.globaltimes.cn/page/202105/1224333.shtml>.

⁶ See, e.g., Erin Hale, *Vaccines Become Political as Taiwan Wakes Up to COVID Reality*, NIKKEI ASIA (June 8, 2021), <https://asia.nikkei.com/Spotlight/Coronavirus/COVID-vaccines/Vaccines-become-political-as-Taiwan-wakes-up-to-COVID-reality>; Helen Davidson, *How Taiwan's Struggle for COVID Vaccines Is Inflaming Tensions with China*, THE GUARDIAN (June 14, 2021), <https://www.theguardian.com/world/2021/jun/14/how-taiwan-struggle-for-covid-vaccines-is-inflaming-tensions-with-china>.

⁷ Keoni Everington, *Taiwan Will Not Buy Made-in-China Version of Pfizer Vaccine: CECC Head*, TAIWAN NEWS (Nov. 12, 2020), <https://www.taiwannews.com.tw/en/news/4051726>.

⁸ Yi-Ching Chang, *Coronavirus/Hon Hai Founder Criticizes Speculation on COVID Vaccine Procurement*, FOCUS TAIWAN (Jul 4, 2021), <https://focustaiwan.tw/society/202107040005>.

⁹ But cf. Nectar Gan & Eric Cheung, *Taiwan Blames China for Slowing Down its Access to COVID-19 Vaccines. The Reality is More Complicated*, CNN WORLD (May 22, 2021), <https://edition.cnn.com/2021/05/21/asia/taiwan-covid-vaccine-intl-hnk/index.html>.

¹⁰ GT Staff Reporters, *supra* note 5.

Pharma. However, the recent vaccine shortage since May 2021 has forced the authority to relax its position. While the Taiwanese government continues to insist on directly negotiating with BioNTech,¹¹ it now allows private entities to take part in the procurement processes to avoid the sovereignty controversy.¹² Two Taiwanese flagship technology giants, Taiwan Semiconductor Manufacturing (hereinafter, “TSMC,”) and Hon Hai Precision Industry Co. (hereinafter, “Hon Hai”), commonly known as Foxconn, have been the two major participants.¹³ But how such processes are actually carried out remains rather secretive. Reportedly, on July 9, 2021, both TSMC and Hon Hai, along with its charity foundation Yonglin, concluded advance procurement agreements with Fosun Pharma. The Chinese company only functions as an intermediary to ensure the German-made BioNTech COVID-19 vaccines are delivered directly to Zuellig Pharma, a qualified Taiwanese vaccine importer entrusted by TSMC, Hon Hai, and Yonglin. In this scenario, the Taiwanese government merely acts as a donee that receives vaccines from these three

private entities rather than as a direct contracting party.¹⁴

Selective Eligibility

Due to the strict conditions required to store and distribute COVID-19 vaccines, major suppliers, including Moderna, Pfizer and Johnson & Johnson, have adopted a restrictive policy regarding the entities with whom they contract. While most of them are willing to make deals with central governments and supranational organizations, it remains to be seen whether subnational government entities, private corporations, and NGOs can also purchase vaccines directly from these suppliers. With some rare exceptions,¹⁵ pharma companies such as Moderna and Pfizer have made clear that they would only conclude contracts with central states.¹⁶

Although excluding private sectors from entering bilateral procurement agreements helps ensure the public have more equitable access to COVID-19 vaccines, this policy can also be harmful to countries where private sectors tend to have

¹¹ Ben Blanchard, *China's Fosun Says Willing to Provide BioNTech Vaccines to Taiwan*, REUTERS (May 22, 2021), <https://www.reuters.com/business/healthcare-pharmaceuticals/chinas-fosun-says-willing-provide-biontech-vaccines-taiwan-2021-05-22/>.

¹² Yimou Lee & Ben Blanchard, *Taiwan to Allow Foxconn's Gou, TSMC to Negotiate for Vaccines*, REUTERS (June 18, 2021), <https://www.reuters.com/world/asia-pacific/foxconn-founder-asks-taiwan-allow-vaccine-talks-with-chinese-firm-2021-06-18/>.

¹³ Bloomberg, *Taiwan Recruits TSMC, Foxconn to Secure BioNTech Vaccines*, TIME (June 18, 2021), <https://time.com/6074333/taiwan-recruits-tsmc-foxconn-to-secure-biontech-vaccines/>.

¹⁴ See also Department of Information Services (新聞傳播處), *The Executive Yuan Helps Problems that Private Corporate Entities Encounter to Purchase Vaccines and Donate them to the Government and Will Authorize TSMC and Hon Hai/Yonglin Foundation to Procure Original BNT Vaccines and donate to the Government* (政院協助解決民間企業團體購買疫苗捐贈政府所遇問題 將授權同意台積電、鴻海/永齡基金會洽談 BNT 原廠製造之疫苗捐贈政府), EXECUTIVE YUAN OF REPUBLIC OF CHINA (TAIWAN) (行政院) (June 18, 2021), <https://www.ey.gov.tw/Page/9277F759E41CCD91/be353c69-ec47-4140-96e3-38c84e014d06>; Yimou

Lee, *EXCLUSIVE Taiwan's Terry Gou, TSMC Reach Initial Agreements for BioNTech Vaccines – Sources*, REUTERS (July 3, 2021), <https://www.reuters.com/business/healthcare-pharmaceuticals/exclusive-taiwans-terry-gou-tsmc-reach-initial-agreements-biontech-vaccines-2021-07-02/>; Ben Blanchard & Yimou Lee, *BioNTech COVID-19 Vaccines Coming to Taiwan*, REUTERS (July 11, 2021), <https://www.reuters.com/world/asia-pacific/tsmc-says-it-is-process-signing-deal-biontech-covid-19-vaccines-2021-07-11/>; SHANGHAI FOSUN PHARMACEUTICAL (GROUP) CO., LTD., PUBLIC ANNOUNCEMENT ON THE DEVELOPMENT OF THE PERMITTED PROJECT OF THE SUBSIDIARY (关于控股子公司许可项目进展的公告) (July 12, 2021), <https://www.fosunpharma.com/uploads/2021071284456.pdf>.

¹⁵ See, e.g., CNN Philippines Staff, *1.3 Million AstraZeneca Doses for Private Sector to Arrive in June—Conception*, CNN PHILIPPINES (May 5, 2021), <https://cnnphilippines.com/news/2021/5/5/1.3-million-doses-of-AstraZeneca-for-private-sector-to-arrive-in-june.html>.

¹⁶ BS Web Team & Agencies, *Pfizer Says It Will Supply COVID Vaccine Only to Central Govt, Not States*, BUSINESS STANDARD (May 24, 2021), https://www.business-standard.com/article/current-affairs/pfizer-says-it-will-supply-coronavirus-vaccine-only-to-central-govts-121052400950_1.html.

better financial and institutional capacity to negotiate vaccine deals and to deliver vaccination than the government. To overcome this dilemma, a compromise solution is to arrange a tripartite agreement among the state, supplier, and private sector. One recent example is the Government of the Philippines, which signed such an agreement with the Manila-listed company International Container Terminal Services, Inc. and Moderna in March 2021 for 20 million doses.¹⁷

For concerns about both safety and equality, most countries to date remain reluctant to permit private imports of COVID-19 vaccines. Yet as the pandemic continues, some governments have lifted the ban. For example, Pakistan, severely hit by a third wave of COVID-19 infections in early 2021, has allowed private sectors to import vaccines for commercial sales that operate independently of the national vaccination programme.¹⁸ Deals with China's CanSino Biologics (the "Convidecia") and Russia's Sputnik V COVID vaccines were concluded by private entities as early as March 2021.¹⁹ Similar policies were also adopted by India in May 2021, which allowed private sectors and persons to import vaccines insofar as the importer can obtain the import license from the Central Drugs Standard Control Organisation (CDSCO), in accordance with the relevant regulations.²⁰

Private imports of pandemic vaccines, however, have raised concerns about the equity of accessibility, especially in countries where the problem of social inequality has been stark. This problem is exacerbated when commercial sales are not governed by a fair and equal regulation on pricing and vaccination priority. In the Pakistani case, for instance, two doses of the Russian Sputnik V vaccine cost around US\$80, four times the international market price (US\$20), whereas the monthly income of an average Pakistani household is only US\$273.20.²¹ Consequently, as vaccines are unaffordable for most low-income families, the rich-poor divide will be further sharpened during the pandemic.²²

Nationalism Entrenched

The entrenchment of nationalism is probably the most fundamental challenge to the promotion of global vaccine equity. In the case of bilateral procurement, for example, developed countries and supranational organizations have been the primary actors that dominate this procurement arrangement. As early as August 2020, Canada had signed advance purchase agreements with multiple drug companies, including BioNTech-Pfizer, Moderna, Johnson & Johnson, and Novavax.²³ The European Commission, too, concluded an advance agreement with AstraZeneca on August 27, 2020—five months

¹⁷ Catherine S. Valente and TMT, *PH Signs Tripartite Vaccine Deal with Moderna, Razon Group*, THE MANILA TIMES (Mar. 19, 2021), <https://www.manilatimes.net/2021/03/19/news/ph-signs-tripartite-vaccine-deal-with-moderna-razon-group/853241>.

¹⁸ Jessie Yeung and Sophia Saifi, *Vaccines Sell Out in Pakistan as the Private Market Opens, Raising Concerns of Inequality*, CNN (Apr. 12, 2021), <https://edition.cnn.com/2021/04/12/asia/pakistan-covid-private-vaccines-dst-intl-hnk/index.html>.

¹⁹ See, e.g., Umar Farooq and Asif Shahzad, *Pakistan to Start Private Imports of CanSino COVID-19 Vaccine for Sale*, REUTERS (Mar. 22, 2021), <https://www.reuters.com/article/us-health-coronavirus-pakistan-vaccine-idUSKBN2BE0N3>; Syed Raza Hassan, *Young Pakistanis Rush to Purchase Russian Vaccine as Private Sales Open*, REUTERS (Apr. 5, 2021), <https://www.reuters.com/article/us-health-coronavirus-pakistan-vaccine-idUSKBN2BR0LH>.

²⁰ See Sneha Mordani, *Drug Regulator CDSCO Gives Nod to Import Vaccines, Paves Way for Private Players*, INDIA TODAY (May 7, 2021), <https://www.indiatoday.in/coronavirus-outbreak/story/drug-regulator-cdsc-gives-nod-to-import-vaccines-in-india-1799760-2021-05-07>.

²¹ Yeung and Saifi, *supra* note 11; *About Vaccine*, SPUTNIK V <https://sputnikvaccine.com/about-vaccine/> (last visited Aug. 15, 2021).

²² Salman Masood, *Pakistan's Private Vaccine Sales Highlight Rich-Poor Divide*, N.Y. TIMES (May 22, 2021), <https://www.nytimes.com/2021/05/22/world/asia/pakistan-private-vaccines.html>.

²³ See, e.g., Ryan Patrick Jones & Kathleen Harris, *Feds Sign Agreements with Pfizer, Moderna for Millions of Doses of COVID-19 Vaccines*, CBC (Aug. 6, 2020), <https://www.cbc.ca/news/politics/vaccine-procurement-anand-bains-1.5674820>.

before the company received marketing authorization throughout the EU for its Vaxzevria (previously named as the COVID-19 Vaccine AstraZeneca) on January 29, 2021.²⁴ Other high-income countries such as Australia, the US, Singapore, and EU member countries have also secured a substantial numbers of vaccine doses, mainly by making deals with Pfizer and Moderna, leaving poorer countries to wait for vaccine leftovers probably until 2023.

The problem with bilateral procurement is apparent: low-income countries cannot afford to purchase sufficient vaccine doses.²⁵ The multilateral platform of the COVID-19 Vaccines Global Access Facility (COVAX) is a collaborative attempt to mitigate the risk. Led jointly by Gavi, the Coalition for Epidemic Preparedness Innovations, and the WHO, COVAX aims to provide vaccines for countries unable to secure their procurement via drug companies.²⁶ Specifically, COVAX's allocation mechanism consists of two phases. In the first phase, vaccine doses are allocated to participant countries in fixed and equal proportion that cover up to 20% of their population. After that target is met, COVAX enters the second phase whereby vaccines are distributed to participants according to their

individual circumstances, such as their severity of COVID-19 impact and health system capacity.²⁷

COVAX has so far fallen short, however, severely undermined by the competition of bilateral deals from rich countries over vaccine doses.²⁸ The recent development of vaccine distribution has witnessed a trend towards nationalism.²⁹ There remains “a startling lack of solidarity between countries.”³⁰ Countries that have secured vaccine doses through bilateral agreements are becoming less enthusiastic about engaging in a multilateral platform like COVAX. The number of vaccine doses that COVAX can acquire is likely to be dwarfed by the proliferation of bilateral procurement. The supply issues that COVAX is currently facing are no doubt symptomatic of this worrying trend. In June 2021, the COVAX platform did not receive any doses from AstraZeneca, the Serum Institute of India, and Johnson & Johnson.³¹

Similar problems of nationalism also take place in the case of cross-border licensing. The EU's vaccine export control, the “export authorisation scheme” officially introduced in March 2021, is one of the worrying precedents, as it requires vaccine exports from the EU to acquire advance permission so that its own advance purchase agreements can be prioritized.³² And as the EU

²⁴ EUROPEAN MEDICINES AGENCY, <https://www.ema.europa.eu/en/medicines/human/EPAR/vaxzevria-previously-covid-19-vaccine-astrazeneca> (last visited Aug. 15, 2021).

²⁵ Siddhanth Sharma, et al., *WHO's Allocation Framework for COVAX: Is It Fair?* J. MED. ETHICS (2021), doi: 10.1136/medethics-2020-107152.

²⁶ Seth Berkeley, *COVAX Explained*, GAVI (Sep. 3, 2020), <https://www.gavi.org/vaccineswork/covax-explained>.

²⁷ WORLD HEALTH ORGANIZATION, FAIR ALLOCATION MECHANISM FOR COVID-19 VACCINES THROUGH THE COVAX FACILITY (2020), <https://www.who.int/publications/m/item/fair-allocation-mechanism-for-covid-19-vaccines-through-the-covax-facility>.

²⁸ See also Gabriele Steinhauser, et al., *Why a Grand Plan to Vaccinate the World Against Covid Unraveled*, WALL ST. J. (May 26, 2021), <https://www.wsj.com/articles/why-a-grand-plan-to-vaccinate-the-world-against-covid-unraveled-covax-11622045728>; Mark Eccleston-Turner & Harry Upton, *International Collaboration to Ensure Equitable Access to Vaccines for COVID-19: The ACT-Accelerator and the COVAX Facility*, 99 MILBANK Q. 437 (2021); Annalisa Merelli,

Poor Countries Will Have to Wait for COVID-19 Vaccine Leftovers until 2023, QZ (June 9, 2021), <https://qz.com/2017272/rich-countries-are-buying-up-all-the-covid-19-vaccines/>.

²⁹ Cristina Mesa-Vieria, et al., *The Dark Side of the Moon: Global Challenges in the Distribution of Vaccines and Implementation of Vaccination Plans against COVID-19*, 149 MATUREITAS 37-38 (2021); Ann Danaiya Usher, *A Beautiful Idea: How COVAX Has Fallen Short*, 397 LANCET, 2322-25 (2021).

³⁰ Lancet Editorial, *Access to COVID-19 Vaccines: Looking beyond COVAX*, 397 LANCET 941 (2021).

³¹ Michael Shields & Stephanie Nebehay, *Just Give Us the Vaccines, WHO Pleads, as Poor Countries Go Wanting*, REUTERS (June 26, 2021), <https://www.reuters.com/world/just-give-us-vaccines-who-pleads-poor-countries-going-wanting-2021-06-25/>.

³² See EUROPEAN COMMISSION, COMMISSION STRENGTHENS TRANSPARENCY AND AUTHORISATION MECHANISM FOR EXPORTS OF COVID-19 VACCINES (2021), https://ec.europa.eu/commission/presscorner/detail/en/ip_21_1352; Jakob Hanke

lawsuit against AstraZeneca for its delays in vaccine deliveries in April 2021 shows,³³ an immediate legal controversy arising from this nationalist trend concerns how suppliers should reconcile the competing demands between domestic needs and their contractual commitments to overseas partners, as well as the extent to which the current practice of vaccine nationalism may pose a threat to the international right to health.³⁴

Conclusion: Law, Power, and Vaccine Justice

The delivery of global vaccine justice has so far been frustrating, circumscribed by power and domination often under the guise of national interests and security. Bilateral procurement deals have continued to be the exclusive domain of wealthy Euro-American countries and their high-income allies. The operation of the multilateral COVAX scheme is undercut by such monopolization as well as by vaccine nationalism. Moreover, outsourcing and licensing arrangements in cross-border settings, as the friction between Taiwan and Fosun Pharma showed, can be compromised by political considerations irrelevant to health security. The global vaccine inequity is undoubtedly a symptom of the uneven distribution of world powers.

As illustrated in this Research Brief, the current practice of bilateral procurement seems to function predominantly as the barrier to global vaccine justice,³⁵ bound up in power relations that prioritize privilege over equitable access to health and security. In contrast to only 1.3% of the population in low-income countries that has received at least one vaccine dose, the fact that rich countries are moving forward with booster shots demonstrates that such inequality is deeply entrenched.³⁶ This worrying trend raises further important research questions as to how law should be promoted to enhance the delivery of vaccine equity and whether the current mode of power relations can be reconfigured, or improved upon, by non-Western actors and other different approaches to global health governance—China and its “Health Silk Road” (健康丝绸之路) being one such potential alternative.³⁷ As new variants of coronavirus such as the Delta variant continue to spread across the world, these questions are crucial and worth further study.

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Vela & Ryan Heath, *Brussels Blocks Vaccine Exports in All but Name*, POLITICO (Apr. 7, 2021), <https://www.politico.eu/article/vaccine-export-block-europe-coronavirus-astrazeneca/>; *EU to Extend Vaccine Export Control Mechanism until End of September*, REUTERS (June 22, 2021), <https://www.reuters.com/world/europe/eu-extend-vaccine-export-control-mechanism-until-end-september-2021-06-22/>.

³³ Al Jazeera & New Agencies, *EU Lawsuit against AstraZeneca Begins in Brussels Court*, ALJAZEERA (Apr. 28, 2021), <https://www.aljazeera.com/news/2021/4/28/eu-lawsuit-against-astrazeneca-begins-in-brussels-court>; James Frater & Angela Dewan, *EU Sues AstraZeneca after Delays in Vaccine Deliveries*, CNN BUSINESS (Apr. 26, 2021), <https://edition.cnn.com/2021/04/26/europe/eu-astrazeneca-vaccines-sue-legal-intl/index.html>.

³⁴ See Armin von Bogdandy & Pedro A. Villarreal, *The Role of International Law in Vaccinating Against COVID-19*:

Appraising the COVAX Initiative, MAX PLANCK INSTITUTE FOR COMPARATIVE PUBLIC AND INTERNATIONAL LAW RESEARCH PAPER NO. 2020-46 (2020), <https://ssrn.com/abstract=3733454>.

³⁵ See Alexandra L. Phelan, et al., *Legal Agreements: Barriers and Enablers to Global Equitable COVID-19 Vaccine Access*, 396 LANCET 800 (2020).

³⁶ See also Editorial, *The WHO is Right to Call a Temporary Halt to COVID Vaccine Boosters*, NATURE (Aug. 17, 2021), <https://www.nature.com/articles/d41586-021-02219-w>; Centers for Disease Control and Prevention, *Joint Statement from HHS Public Health and Medical Experts on COVID-19 Booster Shots* (Aug. 18, 2021), <https://www.cdc.gov/media/releases/2021/s0818-covid-19-booster-shots.html>.

³⁷ See People's Daily (人民日报), “Health Silk Road” Safeguards Lives (“健康丝绸之路”为生命护航), CPC NEWS (Mar. 24, 2002), <http://theory.people.com.cn/BIG5/n1/2020/0324/c40531-31645276.html>.