

# Policy Responses to COVID-19: Lessons for the Global Trade and Investment Regime

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## Research Article

**Keywords:** COVID-19, trade and investment rules, pandemic policies

**Posted Date:** August 1st, 2022

**DOI:** <https://doi.org/10.21203/rs.3.rs-1871375/v1>

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**Version of Record:** A version of this preprint was published at Globalization and Health on September 1st, 2023. See the published version at <https://doi.org/10.1186/s12992-023-00961-6>.

## Abstract

# Background

During the past two years, the COVID-19 pandemic has cost millions of lives around the globe, caused major morbidity and provoked widespread economic and social disruption. In response, governments have enacted policies to mitigate the impacts of the pandemic. This research focuses on policies aimed at increasing access to essential health products and services by comparing them to the global rules governing trade, investment and intellectual property. We have assessed whether these rules have- or could have- constrained countries in responding to this and future crises. The study identifies the nature and scope of the trade-related health sector policies implemented by a sample group of countries, selected because of their systemic significance: the United States, Germany, France, China, South Africa and India. Each policy is placed into one of five broad categories covered by trade and investment rules so that we could assess their consistency with those rules.

## Results

We found that the types of trade-related health measures were quite diverse. The high-income countries in our study were the most active in the policy space and tended to rely on subsidies-based measures while the middle-income countries relied more heavily on export and import measures. Policies directly relevant to intellectual property protection were virtually non-existent. When evaluating the implemented policies against the global trade and investment rules, we found potential inconsistencies with five different types of rules: those governing subsidies, import and export trade barriers, investment measures, government procurement and trade-related intellectual property.

## Conclusions

Given the tension between the global rules and the practices of policy making during the pandemic, we conclude that this tension must be resolved in favor of governments making policy rather than relying on existing exceptions or pushing national governments to comply more exactly with the rules. Although the pandemic itself does not respect national borders, governance still generally occurs at the national level because national governments are often the only entities with both the legal authority and the practical ability to respond.

## Background

During the past two years, the COVID-19 pandemic has cost millions of lives around the globe, caused major morbidity and provoked widespread economic and social disruption (Gurgula 2021).

In response, governments have enacted policies to mitigate the impacts of the pandemic, including those aimed at personal protection and health, those offering financial stability in the face of the economic impacts, and those focused on producing and deploying key COVID-19 products. This present research principally considers policies of the third type - aimed at increasing access to essential health products and services - in the context of the global rules governing trade, investment, and intellectual property. We wish to assess whether these rules have - or could - constrain countries in responding to this and future crises.

Many global trade and investment rules reflect a definite preference for policies that allow goods and capital to flow freely across the globe. By contrast, global intellectual property (IP) rules require countries to protect the rights of those holding the protected knowledge and ensure that others do not use that knowledge without permission.<sup>1</sup> For many

countries, this tension between trade and investment policies and IP policies (where countries may be reluctant to make changes) becomes exacerbated during an acute crisis such as the pandemic. The actions taken to mitigate the impact of the COVID-19 pandemic present an important opportunity to identify aspects of current trade rules that could impede appropriate crisis responses and to address areas where those rules and corresponding institutions should be reformed.<sup>2</sup>

The study identifies the nature and scope of the trade-related health sector policies implemented by a sample group of countries during from March 1, 2020 to August 31, 2021. It includes six large countries whose actions could be systemically significant: the United States, Germany, France, China, South Africa and India.

This research draws primarily from the Global Trade Alert (GTA) database which seeks to document all trade-related interventions implemented by states during this period. For each country it tallies the total number of state acts identified as “harmful/discriminating” or “likely harmful/discriminating” toward trading partners, compared to existing trade and investment rules. A second source is the World Intellectual Property Organization’s (WIPO) COVID-19 IP Policy Tracker which catalogues all changes to IP laws made during that time. We then place each of the intervention types into five broad categories covered by the trade and investment regime: subsidies, trade measures, investment measures, government procurement and intellectual property measures, and identify the main global rule-based constraints which could prove obstacles to these policies. The discussion section draws on existing scholarly literature to explore how to resolve the tension between the rule-based constraints and the trends in pandemic policy making. We conclude that governments need policy space for experimentation so that they can seek to meet the needs of their populations in a crisis, without facing an international dispute as a result.

[1] The reasoning behind the very different treatment of tradable physical goods compared to intellectual property is partly rooted in the concept of innovation as a “public good” and therefore in need of different treatment within the market. A longer discussion of this concept as it applies to both public health and innovation is in the Discussion section.

[2] It is important to note at the outset that not every policy implemented by governments during the pandemic effectively and equitably corrected global market failures. The authors do not endorse every government policy cataloged here as “good” or even justifiable.

## Methods

This study focused primarily on policies aimed at increasing production of or access to key COVID-19 related products, such as health technologies, diagnostics, personal protective equipment, treatments and vaccines. We exclude more general policies aimed at alleviating economic distress, as well as policies aimed at domestic behaviors, such as social distancing, mask mandates, stay-at-home orders, school closures, vaccine rollouts and travel restrictions.

### *Cataloging policies*

We gathered information from various web-based databases that track government intervention during the pandemic. Our search uncovered eight relevant databases (Box 1), which had various lists of pandemic-related policy responses.

### **Box 1. Web-based sources for relevant policy responses**

**International Monetary Fund (IMF):**

<https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

*Provides narrative summaries of key economic responses by governments to limit the human and economic impact of the pandemic. Includes 197 economies.*

**WIPO COVID-19 IP Policy Tracker:**

<https://www.wipo.int/covid19-policy-tracker/>

*Tracks information on measures adopted by IP offices in response to the COVID-19 Pandemic*

**International Trade Centre (ITC):**

<https://www.macmap.org/covid19>

*Catalog and mapping of temporary trade measures (import and export) imposed by countries in response to COVID-19*

**OECD Policy tracker:**

<https://www.oecd.org/coronavirus/country-policy-tracker/>

*Comprehensive catalog of all measures in various categories imposed by OECD countries (includes fiscal and monetary, employment and social and health policies)*

**Oxford COVID-19 Government Response Tracker:**

[https://www.bsg.ox.ac.uk/sites/default/files/2021-06/BSG-WP-2020-032-v12\\_0.pdf](https://www.bsg.ox.ac.uk/sites/default/files/2021-06/BSG-WP-2020-032-v12_0.pdf)

*Working Paper (regularly updated) with a catalog of government responses to COVID-19 as well as analysis of how those measures correlate to changes in COVID-19 cases, hospitalizations and deaths.*

**Yale School of Management Financial Response Tracker Visualization:**

<https://som.yale.edu/faculty-research-centers/centers-initiatives/program-on-financial-stability/covid-19-tracker>

*Catalog and mapping of individual government economic financial policies introduced or amended to combat the negative effects of the coronavirus outbreak*

**Global Trade Alert (GTA):**

<https://www.globaltradealert.org/>

*Comprehensive catalog of all government measures imposed since 2009, identified primarily by type of measure and whether it is trade "liberalizing" or "harmful".*

**Institute of International Finance (IIF):**

[https://www.iif.com/Portals/0/Files/Databases/COVID-19\\_responses.pdf?ver=2020-07-30-173749-083](https://www.iif.com/Portals/0/Files/Databases/COVID-19_responses.pdf?ver=2020-07-30-173749-083)

*Catalog of financial and stabilization policies imposed by developed country markets, as well as the IMF and the G20.*

After a preliminary assessment of these databases and documents, we determined that the Global Trade Alert (GTA) database could function as our primary data source, while relying on the other web-resources as secondary sources that contain information not available in the GTA dataset. This is based on the comprehensive nature of the GTA database, as well as the related information for each government intervention. Each measure is categorized within a specific typology of government intervention and flagged as being either "harmful/discriminating" (designated as red policies),

“likely harmful/discriminating” (designated as amber) or “liberalizing” (designated as green) with respect to global trade (Evenett 2019).<sup>3</sup>

To further support the decision to rely primarily on the GTA database, we validated the information that was presented in GTA against the other databases mentioned above using the following assessment questions:

- How much and what kinds of overlap in information is there between the GTA and the other three databases?
- How easy is it to determine this overlap, if any exists? For instance, do the databases use a variable that can be used to link both databases (e.g. name of the state act)?
- Can the other databases provide complementary information not found in GTA that is relevant to this research?

The data gathered includes measures beginning on March 1, 2020, as indicative of the beginning of government awareness and intervention in response to the pandemic. The database was published on July 31, 2021 and assayed on August 31, 2021 by downloading into Excel.

### *Intervention types and the current trade and investment rules*

We categorized the 24 GTA-identified intervention types from our study into four broad categories: subsidies, trade measures (tariffs and quantitative restrictions), investment measures and public procurement. These categories align generally with the way that the creators of the GTA group their policy data ([1] capital controls and exchange rate policies, [2] export and import measures, [3] foreign investment measures, [4] labor force migration rules, [5] localization requirements, [6] public procurement, [7] subsidies and state aid, [8] trade defense instruments and [9] other instruments) (Evenett & Fritz 2020). We grouped the policies in larger buckets based on the authors’ prior understanding of the rules governing global trade and investment, such that export and import measures were grouped with trade defense instruments (trade measures) and localization requirements were found in both investment and public procurement measures. Our study did not find any capital controls/exchange rate policies, labor force migration rules or other instruments for the countries and time period covered. When an intervention was typically labeled differently in sources outside of the GTA we re-categorized it to more specifically reflect the nature of the intervention. For instance, our team chose to categorize US subsidies to private production of vaccines as production subsidies rather than the GTA’s choice to put them into the more amorphous state aid category. Given that the GTA did not capture any changes to IP laws or grants of compulsory licensing, we added policies from the World Intellectual Property Organization’s (WIPO) COVID-19 IP Policy Tracker to make sure we included those IP policies as well.

Once categorized, we used a purposive sample of policy acts in each of the five categories for each of the countries based on their prominence in trade and health policy literature and reporting. Examples of such prominent policies are India’s licensing requirement for exports of Amphotecerin B, the US, EU and Indian government support for vaccine development and the US, EU and South African airline support measures.

<sup>3</sup> A further comprehensive description of the GTA’s methodology can be found in Evenett 2019

## **Results**

### **General findings: the catalog of policy interventions**

We found that the types of trade-related health measures deployed during the pandemic were diverse, ranging from policies aimed at funding or collaborating with pharmaceutical companies, to increasing domestic investment in health sectors, to policies attempting to reduce shortages of essential products by ramping up their domestic manufacturing or

preventing their exportation. Moreover, while all the countries in the study were active in implementing a wide array of measures, the high-income countries were generally much more likely to take policy action.

Table 1 quantifies the total number of distinct policy interventions, focusing especially on the health sector (column 3).<sup>4</sup> To further understand these policies, we created a 5-part typology of policy interventions (described more fully in Table 3, below) and mapped the rules of global economic governance onto these policies to identify areas of potential conflict. The table shows the most prevalent types of policy interventions by each country (Table 1: columns 4-8). For our sample of countries, subsidy policies (column 4) were the most numerous and among the most diverse, e.g., targeted subsidies to domestic producers, capital injections into private firms, government advance purchase agreements for vaccines and treatments, and others. Tariffs and quantitative restriction policies followed next (column 5), e.g., import and export restrictions, import and export licensing requirements, tariff quotas, and others. Investment measures (column 6) included only a short list of new rules governing foreign direct investment, local sourcing and localization incentives. Public procurement policies (column 7) governing direct government purchases of goods and services were less extensive and included access rules, localization requirements and preference margin incentives.

Policies directly relevant to the health demands of the pandemic that could be constrained by trade policies related to intellectual property, such as those found in the WTO Agreement on Trade-Related Aspects of Intellectual Property (TRIPS agreement) were virtually non-existent. In our sample, only France and Germany each made subtle changes to their compulsory IP licensing procedures to make them easier to issue during the pandemic (WIPO 2021).

**Table 1:** Quantitative Overview

Country (in order of nominal GDP per capita) (1)	Total # of interventions enacted (2)	# of Health sector interventions (as % of total) (3)	# of health sector subsidies (as % of health sector measures) (4)	# of health sector trade measures (5)	# of health sector investment measures (6)	# of health sector public procurement measures (7)	# of health sector IP measures (8)
USA	476	70 (14.7%)	49 (70%)	19 (27%)	1 (1%)	1 (1%)	0
Germany	263	28 (10.3%)	15 (54%)	9 (32%)	3 (11%)	0	1 (4%)
France	161	39 (23.8%)	26 (67%)	8 (21%)	4 (10%)	0	1 (3%)
China	32	7 (21.9%)	2 (29%)	5 (71%)	0	0	0
South Africa	33	5 (15.2%)	3 (60%)	2 (40%)	0	0	0
India	170	56 (32.9%)	17 (30%)	32 (57%)	3 (5%)	4 (7%)	0

**Sources:** GTA 2021; WIPO 2021; Authors' calculation.

As shown by Table 1, the higher the nominal GDP per capita of each country, the higher the number of interventions, except for India. The US dominates the list with 476 distinct total policies as well as with the greatest number of trade-related health sector policies, primarily subsidies. For the US, France and Germany, subsidies were the most common policy tools, while procurement and investment measures were the least common. In contrast, China and India relied relatively more on tariffs and quantitative restrictions than on subsidies (see Figure 1).<sup>5</sup> India's interventions focused heavily on the health sector compared with the other study countries, although these measures still made up a minority of its interventions. China implemented the fewest number of policy interventions during the time period.

Table 2 disaggregates broader intervention types more specifically. Some policy tools are used by most or all countries: state aid or state loans, export licensing requirements, import tariffs and anti-dumping duties. The data show the prevalence of subsidies, especially by our high-income countries. India deployed the greatest number of distinct intervention types, while South Africa used the fewest. It is also notable that the policy types deployed by France and Germany are the most similar to one another, likely reflecting the fact that the pandemic response was partly shaped at the level of the European Union.

**Table 2:** Interventions Impacting Pharmaceutical and non-Pharmaceutical Health Sectors by Country

Broad Intervention Category	Intervention Type	USA	Germany	France	China	SA	India
Subsidies	Capital injection (e.g., bailouts)			2			
	Financial grant	18		8			3
	Interest payment subsidy						1
	Loan guarantee		4	4			
	Production subsidy	1					7
	State aid	28					3
	State loan	2	9	11	1	3	
	Tax or social insurance relief	1		1	1		1
	Trade finance		2				2
Tariffs and quantitative restrictions	Anti-dumping	4	2	2	1		19
	Anti-subsidy	3			1		1
	Export ban						1
	Export licensing req't	1	4	4	1	2	4
	Export quota						1
	Export-related Non-Tariff Measures	10					1
	Import ban						4
	Import licensing req't				1		
	Import tariff	1	1	1	1		1
	Import tariff quota		2	1			
Investment measures	Foreign Direct Investment (FDI): Entry and ownership rule		1	2			
	FDI: Treatment and operations, other	1					
	Local sourcing						3
	Local operations		2	2			
Public procurement	Public procurement localization	1					4
IP law changes	Compulsory licensing procedures		1	1			
<b>TOTAL</b>		70	27	38	7	5	56

**Source:** GTA 2021; WIPO 2021; Authors' calculation.

### Relationship between policies and rule-based constraints

As described above in Table 1, we created a 5-part typology of policy interventions and mapped the rules of global trade, investment, and intellectual property rules onto these policies to identify areas of potential conflict (see Table 3, below).

What follows is a general overview of the legal obligations under multilateral, bilateral or regional free trade agreements, as well as investment treaties. We then compare the policy interventions during the pandemic to those obligations, highlighting to what extent countries are at risk for disputes on the basis of those actions, and discuss future legal risk in the next pandemic.

## 1. SUBSIDIES

The most prevalent type of policy intervention, understanding global rules governing them is of principal importance in mapping the policies onto the rules. The WTO's Agreement on Subsidies and Countervailing Measures (SCM) lays down strictures on government support of industries, though it does not prohibit them outright. Subsidies targeting a specific firm, sector or geographic area can be subject to legal action, either through a WTO dispute or unilateral trade remedies,<sup>6</sup> provided the complaining country can prove injury to their domestic industry, serious prejudice to their economic interests in other markets (Art. 6.3), or (in a small number of cases) "nullification or impairment" of their expected benefits under the suite of WTO Agreements (Art. 5). In this context, the US financial support to Moderna for research and development on the mRNA vaccine platform as well as the European Investment Bank's loan to BioNTech for the same would undoubtedly be "specific" subsidies. State support for vaccine development was not limited to high income countries (See Table 3 for more examples). Rules governing subsidies are not as common outside of the WTO, however the European Union has an extensive set of state aid rules that usually constrains member states' subsidies and related policies.

During this pandemic, when countries acknowledged essential government support and tried novel measures to mitigate its impacts, the likelihood of competing WTO disputes seemed low. Even the EU suspended their state aid rules during the pandemic. Nonetheless, multiple examples of long-running trade disputes between the US and Canada,<sup>7</sup> the US and the EU (Reuters 2021),<sup>8</sup> and the US and India (Suneja 2019)<sup>9</sup> suggest that countries with similar policies are still quite willing to take aim at each other. As the urgency of the pandemic begins to wane and existing firms seek to consolidate or expand their share of the market, WTO disputes and domestic investigations into subsidies and countervailing measures are likely to make an appearance. In particular, countries wishing to support their nascent pharmaceutical industries will find themselves constrained by the rules preventing them from causing injury to domestic incumbents and industries in other countries. The more successful they are in launching new or expanded domestic industries, the more likely they will be mired in costly disputes.

## 2. IMPORT AND EXPORT BARRIERS

The second most prevalent interventions were import and export barriers. The WTO's General Agreement on Tariffs and Trade (GATT) Article XI prohibits any new trade barriers, other than tariffs and similar charges (GATT Art. XI:1). Paragraph two provides exceptions, for export restrictions "temporarily applied to prevent or relieve critical shortages... of essential products" (GATT Art. XI:2). Regional and bilateral free trade agreements (FTAs) also contain prohibitions on new non-tariff barriers to trade that tend to mirror both the rules and the exceptions of Article XI (e.g., USMCA Art. 2.11). General and security exceptions may apply in limited ways to these measures as well and are discussed below.

Export barriers were a common policy approach to address the scarcity of supply of key COVID-19 products (Table 3) India and South Africa introduced new export licensing requirements for COVID-19 health products. Shortly after the pandemic began, Germany imposed an outright ban on exporting personal protective equipment (PPE) and India addressed its vaccine shortage by introducing a rule of "compulsory domestic sale" for vaccines (effectively an export ban). In each instance, these policies would almost certainly fall under the general prohibition on non-tariff barriers (XI:1), although they might well qualify for the exception for relieving critical shortages in essential products (XI:2), as long as they are only temporary.

### 3. INVESTMENT MEASURES

The most complex rules discussed here govern treatment of foreign investors and their investments. Under the WTO, the Agreement on Trade-Related Investment Measures (TRIMs agreement) requires that the GATT standard of national treatment (GATT Art. III) and prohibition on new non-tariff barriers (GATT Art. XI) applies to both trade and investment measures (TRIMs Art. 2). Thus, any measure is likely TRIMS-violative that shapes the investment environment to restrict imports or exports or prefers domestic to imported products.

Suspect health sector investment measures under TRIMs include India's imposition of local content requirements on medical coveralls, German and French introduction of new foreign investment screening in the health and biotech sectors and the EU's localization requirement for firms negotiating advanced purchase agreements, including AstraZeneca and Curevac. Under TRIMS, local content requirements are specifically prohibited measures and localization requirements are likely to have a similar discriminatory impact on the use of imported vs. domestic products.

International investment agreements (IIAs) often have much deeper, more specific and more enforceable commitments than those at the multilateral level, (Crawford and Kotschwar 2020). While TRIMs applies only to investment measures related to trade in goods, the protections in IIAs typically apply to all sectors where foreign investors are present. In addition, IP is often included as a protected investment, (Okediji 2014). Furthermore, express restrictions on performance requirements for investors, including localization requirements, further limits the range of policy tools at a government's disposal for managing crises (UNCTAD 2022).

Finally, the investor-state dispute settlement (ISDS) mechanism prevalent in IIAs provides a unique opportunity in international law for investors to bring private arbitration claims against national governments for government regulations claimed to interfere with the value of their investments. Many have written to critique this system (Schultz and Dupont 2014, Moehlecke & Wellhausen 2022, Sweet, Stone and Saltzman 2017). We note that allowing private stakeholders to sue states outside of their domestic courts removes the ordinary checks and balances of state-to-state dispute settlement mechanisms that are based on potentially mitigating diplomatic or public welfare considerations (Horn 2018, Bernasconi-Osterwalder 2014, De Melo & Otavio 2017). During or after the pandemic, private firms (including pharmaceutical companies) may choose to bring an investor-state claim directly against a country if their in-country investments operations are claimed to have been undermined by policy changes. As discussed below, that could include changes that diminish the expected monetized return on a patent or copyright.

### 4. GOVERNMENT PROCUREMENT

The Government Procurement Agreement (GPA) is a plurilateral agreement within the WTO, meaning that its commitments apply only to its 48 member states (and others that join in the future). The general rules require members to not discriminate against the products, services and firms of fellow members in their procurement decisions (GPA Art. IV.1, IV.4). The US, for example, has not made any procurement commitments with respect to state or local governments, so that they may make their own decisions about whether to comply with GPA purchasing rules (Platzer and Mallett 2019). On the other hand, the US does have a federal level schedule of commitments which does include a range of agencies that purchase medical supplies and pharmaceuticals for the government (Reinsch, Hoffner and Caporal 2020).

As mentioned, the GPA is plurilateral so that the US does not have to extend the same treatment to China as it does to fellow-member EU states, Canada and others. Outside of the GPA countries may have more in-depth procurement commitments – such as more sectors covered by non-discrimination and transparency rules. The US eliminated government procurement commitments with Canada in the process of NAFTA's renegotiation, reverting to the GPA rules

in the new USMCA, although US commitments with Mexico, which is not a GPA member, still stand (Reinsch, Hoffner and Caporal 2020).

Given the scope of these rules, US advance purchase agreements with vaccine suppliers would be covered by the GPA, as well as its new Strategic Active Pharmaceutical Ingredients Reserve - an effort to increase the domestic manufacturing of essential pharmaceutical inputs. The US, however, is not likely to face a WTO challenge on that basis since it strategically funnels purchasing through state and local governments not covered by the GPA (Platzer and Mallett 2019).

## 5. INTELLECTUAL PROPERTY PROTECTION

The WTO Agreement on Trade-Related Aspects of Intellectual Property (TRIPS agreement), provides a well-known baseline of protection, including 20-year pharmaceutical patents (TRIPS Art. 27), with limited exceptions for health emergencies (TRIPS Arts. 30, 31), which are circumscribed by complex rules on domestic efforts to issue compulsory licenses to produce products that are scarce or unaffordable (TRIPS Art. 31). The rules potentially allow a member state without production capacity to request another country to produce a patented product for its use (TRIPS Art 31 *bis*) but this has not been widely used (Vincent 2021). FTAs have introduced “TRIPS-plus” standards which, in practice, extend patent terms, protect clinical trial and other data for longer periods of time and interfere with marketing approvals for generics (Boston University Global Development Policy Center 2019, Labonté et al. 2021). Moreover, many international investment treaties include intellectual property as a covered investment, thus subject to protection and, as mentioned above, enforcement through ISDS.

While countries have been willing to flout international trade commitments in the current crisis, they have been reluctant to ignore global IP rules, and even hesitant to rely on existing flexibilities within the rules, such as compulsory licensing (CL). While Germany and France did make minor tweaks to their CL procedures (WIPO 2021), they did not issue any licenses, and only a small handful of countries did so, with none issued for vaccines (MSF 2021, Baker 2021). If countries did suspend IP rights, they could be susceptible to claims at the WTO and unilateral pressure from countries and regions like the US and the EU, and perhaps to ISDS claims as well. Rather than ignore the rules, some countries sought an official negotiated waiver of provisions of the TRIPS agreement for COVID-19 related products. Proposed in October of 2020 by India and South Africa (WTO 2020), negotiations resulted in a ministerial decision that falls far short of the expansive TRIPS waiver initially proposed (WTO 2022). The reasons for this are rooted in various complexities discussed in more detail below.

### EXCEPTIONS

There are exceptions to many of these trade and investment rules that might make space for non-compliant policies during emergencies. GATT Article XX provides a list of general justifying exceptions such as measures “necessary to protect human, animal or plant life or health” (XX(b)), restrictions on exports to “ensure essential quantities of those materials” (XX(i)) and measures “essential to the acquisition or distribution of products in general or local short supply” (XX(j)). Although some justifications, especially sub-paragraph (b), could be broadly interpreted – the overarching conditions of the Article’s introductory paragraph require that exceptional measures be applied in a way that does not constitute arbitrary or unjustifiable discrimination or a disguised restriction on trade. The WTO’s Appellate Body has relied heavily on this “chapeau” requirement such that few countries have successfully defended policies under Article XX (Moran 2017).<sup>10</sup>

GATT article XXI allows WTO members to take “any action which [they] consider necessary for the protection of [their] essential security interests (iii) taken in time of war or other emergency in international relations” (XXI(b)(iii)). This exception does not include the chapeau requirement of Article XX so it may be interpreted more broadly or flexibly.

Similar Article XXI-type language is found in the General Agreement on Trade in Services (GATS Arts. XIV, XIV*bis*), the TRIPS Agreement (TRIPS Art. 73) and the GPA (Art. 11). Both the TRIMs and SCM Agreements are under GATT, so these general and security exceptions would apply directly and automatically to them. FTAs also tend to retain the language of general and security exceptions. A previous study by one of us found that almost half of all preferential trade agreements notified to the WTO contain an essential security exception similar to that of GATT Article XXI (Thrasher, Sklar and Gallagher 2019).

In the context of a global pandemic, subsidies to support vaccine development and production or export restrictions, for example, could very likely be justified under existing rules and exceptions. As discussed further below, however, relying on exceptions to defend pandemic policy making has both short- and long-term shortcomings.

**Table 3:** Illustrative Typology of Policies and Relevant Provisions

Policy Type and Examples	WTO Rule (citation)	FTA rule (example)
<p><b>Subsidies:</b></p> <p>US, EU, India and China's government support for vaccine development (Moderna, Pfizer/BioNTech, Covaxin, Sinovac and others)</p> <p>South Africa support for firms producing COVID-19 supplies</p> <p>Indian subsidies for firms manufacturing medical devices</p> <p>Various countries' subsidies for acquisition of diagnostic equipment</p>	<p>Specific subsidies are actionable if they cause injury or result in serious prejudice to foreign competitors (SCM Arts. 1 (definition of subsidies), 5 (adverse effects of 'specific' subsidies), 6.3 (serious prejudice))</p>	<p>None beyond the WTO rules.</p>
<p><b>Import/Export Restrictions:</b></p> <p>New export licensing measures (South Africa, India)</p> <p>New export bans on COVID-19 products (India – vaccines, Germany – PPE)</p>	<p>No quantitative restrictions on trade – import or export, except where there are “critical shortages of essential goods” (GATT Article XI)</p>	<p>EU-Ukraine Art. 271</p> <p>USMCA Art. 2.11</p> <p>CPTPP Art. 2.10 (adopting and incorporating GATT Article XI)</p> <p>RCEP Art. 2.17 (adopting and incorporating GATT Art. XI)</p>
<p><b>Investment Measures:</b></p> <p>Indian local content requirement on medical coveralls</p> <p>France and Germany: New foreign investment screening in health and biotech sectors</p> <p>EU advanced purchase agreements with localization requirements (AstraZeneca &amp; Curevac)</p>	<p>No measures which require foreign investors to use local content or export a certain % of their goods (TRIMS Art. 2, Annex)</p>	<p>All including right of establishment: EU-Ukraine Art. 88 (national treatment)</p> <p>USMCA 14.4 (national treatment), 14.10 (performance requirements) CPTPP 19.4 (national treatment), 19.10 (performance requirements)</p> <p>RCEP Arts. 10.3 (national treatment), 10.6 (performance requirements)</p>
<p><b>Government Procurement:</b></p> <p>Indian new local procurement rules for medical device producers selling to the government</p> <p>US advanced purchase of vaccines</p> <p>US SEPIR initiative</p> <p>EU advanced purchase agreements with localization requirements (AstraZeneca &amp; Curevac)</p>	<p>Requires non-discrimination and transparency in government purchasing and contracting decisions among parties to the agreement (GPA Art. IV)</p>	<p>EU-Ukraine Art. 151 (non-discrimination and transparency)</p> <p>USMCA Art. 13.4 (non-discrimination and transparency)</p> <p>CPTPP Art. 15.4 (non-discrimination, and transparency)</p> <p>RCEP Art. 16.4 (transparency only)</p>
<p><b>IP/Compulsory Licensing:</b></p>	<p>TRIPS Agreement, Article 31, 31bis</p>	<p>EU-Ukraine Art. 219 (reaffirming)</p>

Modification of domestic  
CL rules (Germany, France)

the Doha Declaration on TRIPS  
and Public Health)

USMCA Art. 20.6 (affirming

commitment to Doha  
Declaration) CPTPP Art. 18.41  
(incorporates TRIPS by  
reference)

RCEP Art. 11.39 (incorporates  
TRIPS Art. 31, 31bis by  
reference)

**Source:** Authors' analysis.

<sup>4</sup> This refers to domestic processes of complaint by the domestic industry, investigation and findings with respect to the impact on the domestic industry. Although the remedies are governed by domestic law, the SCM Agreement provides guard rails to make sure those processes are fair, transparent and consistent with the general standards governing subsidies (SCM Part V).

<sup>5</sup> See various disputes about Canadian and US lumber industries at DS236, DS247, DS257, DS264, DS277, DS311. [https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds257\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds257_e.htm).

<sup>6</sup> See various disputes about airplane subsidies in the US and the EU at DS 316, [https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds316\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds316_e.htm).

<sup>7</sup> See the tit-for-tat dispute between India and the US at DS456 and DS510.

<sup>8</sup> Moran helpfully lays out the WTO disputes regarding the general exceptions and shows that these are rarely successful but does not conclude that this is problem for states (Moran 2017).

<sup>9</sup> "Health Sector Interventions" are interventions which impact a combined grouping comprised of nine sectors chosen by the authors: (1) basic organic chemicals, (2) basic inorganic chemicals n.e.c, (3) miscellaneous basic chemical products, (4) pharmaceutical products, (5) chemical products n.e.c, (6) medical & surgical equipment and orthopedic appliances, (7) instruments and control equipment, except optical instruments, (8) petroleum, chemical and pharmaceutical manufacturing services, (9) human health services.

<sup>10</sup> South Africa implemented slightly more subsidy measures than trade measures, but the sample size for both South Africa and China are so small as to not be very instructive about trends.

## Discussion: Understanding The Tensions And Trade-offs

The evidence above makes clear that during the early stages of the COVID-19 pandemic, various countries frequently disregarded or circumvented policy constraints arising from WTO and other trade/investment commitments. As they discovered their need for PPE and for diagnostic tools, treatments and vaccines for COVID-19, many governments became proactive. Certain high-income countries deployed extensive financial resources and subsidies in addition to tariffs, trade constraints and in-kind measures. Certain middle-income countries, especially China and India, relied more on non-financial measures like export licensing and quantitative restrictions. Of particular interest was the relative lack of any intellectual property policy changes for our study countries.

What might explain the pattern of policy choices? We speculate that the wealthiest countries preferred subsidies and government procurement to direct trade measures to support domestic production and acquisition of essential goods for two reasons. First, they had the fiscal or monetary space to do so and second, because such measures are considered less directly trade-distorting (Baldwin 1989). Trade measures are more directly trade distortive and are directly prohibited under the trade rules. Middle-income countries tended to not have the fiscal or monetary space of

their higher-income counterparts and may have been forced to rely on other policy instruments, regardless of the transgression of trade rules.

Given that one of the main externalities of IP protection is decreased access to the protected product for a time, loosening IP rules would have been a natural first step to address shortages of COVID-19 products during the pandemic. Although the compulsory license allows a country to issue a license to a local firm to produce an essential good that is otherwise not available (or unaffordable) to its population, global IP rules, particularly TRIPS Article 31 (Article 31 *bis*) place an onerous procedural burden on countries attempting to issue such a license (Baker 2021). Moreover, the patent landscape of COVID-19 products makes the process both complex and iterative. COVID-19 products, particularly vaccines, are often covered by many different patents and other forms of IP, filed in a number of different countries, and as such these licenses are not a simple or quick way to meaningfully expand production (Gaviria and Kilic 2021). Those products also cannot be exported easily. To complicate matters further, companies in the US and Europe have routinely pressured their governments to punish countries for issuing such licenses on their products (Goldman and Balasubramaniam 2015, MSF 2018, New 2019, The Pharma Letter 2021). As a result of these and other instances, countries have, understandably, been reluctant to use the TRIPS agreement flexibilities to issue compulsory licenses.

India and South Africa's October 2020 proposal (and subsequent revision in June of 2021) to waive key provisions of the TRIPS Agreement implicitly recognized that the existing ability to authorize production of essential COVID-19 products was insufficient and inefficient. It covered the full spectrum of IP, data, trade secrets and knowhow that would be required to produce the products. It also recognized that global cooperation is required to effectively increase access to protected health innovation on a scale to address a global pandemic (WTO 2020; WTO 2021).

### **Resolving the tension**

Given the tension between global rules and the actual policy making that took place during the pandemic, how to resolve it? In broad terms, there are three possible approaches. First, one could argue that nothing need change because the exceptions, described above, should be sufficient to protect legitimate public policy making from losing a challenge at the WTO or even an investor-state dispute in the context of a global emergency like the COVID-19 pandemic. Second, one could argue that the main problem lies with the overly activist role of states. If they had followed the global rules better, there would have been more global supply and a more equitable distribution for everyone. Third, one could argue that the main problem lies with the rules themselves. Global trade and investment rules should not stand in the way of public policy making – especially in an acute crisis, but also beyond.

There is a rich literature on the role of exceptions in international jurisprudence (Arato et al 2020, Bartels and Paddeu 2020, Bartels 2015). The concept of pandemic “exceptionalism” suggests that policy-making trends during a pandemic will not necessarily be normalized outside of that context so that exceptions clauses may be sufficient for the majority of policy interventions undertaken in an emergency (Simson 2020). On the other hand, these exceptions are criticized for their insufficiency (e.g., Arato et al 2020) and this may explain why IP exceptions purportedly designed to address global health emergencies are still going largely unexploited (Baker 2021).

Should national public health policies generally take precedence over the current framework of trade and investment law? The answer depends in part on a much older discussion about global public goods - goods which because of their very nature, the market will fail to supply adequately (Seo 2020).<sup>11</sup> Global public goods such as public primary education, the global climate and global health technologies, as well as innovation have positive externalities that will be undervalued by the market. As such, economic theory supports government intervention to promote these goods as a way to correct a market failure (Stiglitz 1999, van den Berg 2011).

There are special international rules for one particular global public good – intellectual property – which actually requires countries to intervene to protect it. The rules, especially those in the TRIPS agreement, implicitly recognize the need to make it worthwhile to generate new knowledge. The tension in IP policy making is to balance the need to compensate innovators with the public’s need for access to new ideas and products. Increasingly strict international IP rules, however, do not seem to consider the dangers of over-protection of IP. Indeed, Joseph Stiglitz has shown that “[a]n excessively broad patent system ... can raise the price of one of the most vital inputs into the innovative process [knowledge itself] and thus reduce the pace of follow-on innovations” (Stiglitz 1999).

Meanwhile, other global public goods do not receive the same protective treatment. Instead, countries must rely on public policy or security exceptions to ensure access to essential products for public health, the environment or other public goods (Peacock 2022). From an economic perspective, global rules do not provide adequate policy space for governments to address key market failures and should be reformed.

This is not to argue that all government policies toward public goods are “good”, either in terms of achieving their stated purposes or avoiding negative externalities for others. Each government introducing new policies makes decisions based on trade-offs –between global and national interests and between private and public interests. While some pandemic policies earned global support (research and development subsidies for mRNA research), others earned widespread condemnation (export constraints of essential products) and still others received critiques suggesting that the policy would have been better if structured or applied differently (public-private innovation partnerships like Moderna-NIH (Stolberg and Robbins 2021, Rizvi 2021)).

From a scientific perspective, the most effective approach to end the pandemic is at the global level (Rackimuthu et al 2022). By its nature the pandemic crossed, and is still crossing, borders repeatedly, fueling wave after wave of infections, illness and death across the globe. However, governance generally occurs at the national level, such that national governments are often the only entities with both the legal authority and practical ability to respond (see Assefa et al. 2022).<sup>12</sup> These governments have the responsibility to protect their citizens and residents; and political leaders perceived that their own standing and even tenure would be determined by their success in doing so. By contrast, there is no global “government”, and existing institutions at the supranational level, such as the World Health Organization (WHO), lack both the authority to mandate responses by states and the means to deliver sufficient public goods.

<sup>11</sup> The same economic theory that demonstrates that global public goods will not be adequately supplied by the market in the absence of government policy, also explains why it fails to supply adequate products for poorer economies. “Weak profit incentives discourage commercial research and development investments in diseases of the poor” since the poor have different health priorities than the rich, but do not have the same purchasing power and the priorities of wealthier countries, in terms of both products and innovation, will win out (Chen et al 1999).

Although some economists argue that the incentives facing the private sector lead to important efficiency gains, increasing supply and therefore possibility for greater overall distribution (Evenett 2020; Bown and Bollyky 2021), studies over the last 30 years have shown that, generally, the private sector under-invests in research and development to address illnesses that plague low-income countries and people because the short-term return on investment is not high (Commission on Health Research for Development 1990; WHO 2012).

<sup>12</sup> In the European Union, some relevant competencies exist at the supra-national EU level.

## Conclusions

In light of our findings and the above discussion, we identify opportunities for reform at global, regional and national levels to respond to the current pandemic as well as building health resilience worldwide. At the 12th Ministerial

Conference of the WTO in June 2022, members adopted a ministerial decision on the TRIPS Agreement, which purportedly addressed the “exceptional circumstances of the COVID-19 pandemic” by “clarify[ing] and waiv[ing]” certain TRIPS provisions (WTO 2022). In actuality, the decision does not make any substantive changes to the existing flexibilities available under TRIPS and has been derided as a “disappointing failure” by advocacy groups (MSF 2022, Baker 2022).

The United States took a promising step when it announced in May 2022 that the National Institutes of Health would be sharing key mRNA technology with the COVID-19 Technology Access Project (C-TAP), the first major producer of mRNA to do so (Knowledge Ecology International 2022). The WHO has begun a collaboration with Afrigen in South Africa to encourage the domestic development and reverse engineering of vaccines beginning with Moderna’s recipe (Nolen 2021). These are all promising steps, but not sufficient in the short or long-term to prepare us for the next pandemic.

In particular, there will be a larger gain for future pandemics and long-term resilience if countries around the world collaborate to build national or regional production hubs that increase availability, affordability and equitable distribution of tests, treatment and vaccines.

Bangladesh is a unique example of a country that has built long-term domestic resilience by deploying a wide array of subsidies, investment measures and health policies over 40 years to build up a pharmaceutical industry from scratch (Rahman et al. 2021). While it originally closed itself off to pharmaceutical investment and imported products, Bangladesh has, more recently, been able to strategically open up due to the competitiveness of its industry. Unfortunately, the policy flexibility underpinning this strategic structural transformation of its’ economy is not generally available to most WTO members. As a Least Developed Country (LDC), Bangladesh has been exempt from many trade and IP commitments at the organization. Other countries have experienced the opposite - a decrease in pharmaceutical market share over time as a result of increasing concentration of pharmaceutical value chains and an inability to support their domestic industry (Horner 2021).

Overcoming this inability to support their own industries will require action by both individual countries and regional country groups. Individual countries with the capacity can build up new pharmaceutical sectors, carefully skirting the rules, while advocating for change at the WTO. At the regional level, countries should collaborate to create structures for regional production hubs with strong accountability mechanisms. There is a rich literature discussing the design of regional manufacturing hubs and distributed manufacturing which we do not recite here (see, e.g., Srαι et al 2020), however researchers are beginning to explore these options as an alternative to traditional global value chains in the face of the COVID-19 pandemic (Phillips et al 2022). Country leaders are taking note and recent efforts to organize manufacturing by region have emerged in both Africa and South America (Buckholtz 2021, Keenan 2021). However, building up regional manufacturing is admittedly a highly complex task that involves a disruption to existing supply chains and re-organization of manufacturing worldwide (Srαι et al 2020). To mitigate the risks of devolving into nationalism in a crisis and increase long-term resilience, these regional hubs will require careful construction and both internal and external accountability mechanisms (Phillips et al 2022).

At a global institutional level, the rules must make space for these efforts. Presently, for the vast majority of countries, any measure that preferences domestic products, services or investment vis-a vis imports or foreign investors is strongly discouraged, or in some cases prohibited (GATT Art. III, TRIMs Art. 2, Annex). Any measure that widens the current distribution of production and supply chains could be claimed to “nullify or impair” the benefits that firms expected when their countries signed trade agreements (GATT Art. XXIII). Our study found that many large and powerful countries were willing to enact policies that directly run up against global trade rules in order to deal with the crisis, but their measures may still be challenged in the future. Less powerful and smaller economies are even more vulnerable. The

global trade regime clearly needs to be re-thought and reformed to allow countries to better address global crises, such as pandemics.

## List Of Abbreviations

BIT Bilateral investment treaty

CL Compulsory license

FDI Foreign direct investment

FTA Free trade agreement

GATS General Agreement on Trade in Services (WTO)

GATT General Agreement on Tariffs and Trade (WTO)

GDP Gross domestic product

GPA Government Procurement Agreement (WTO)

GTA Global Trade Alert

ISDS Investor-state dispute settlement

LDC Least developed country

PPE Personal protective equipment

SCM Agreement on Subsidies and Countervailing Measures (WTO)

TRIMs Agreement on Trade-Related Investment Measures (WTO)

TRIPS Agreement on Trade-Related Aspects of Intellectual Property (WTO)

USMCA United States-Mexico-Canada Free Trade Agreement

VL Voluntary license

WHO World Health Organization

WTO World Trade Organization

## Declarations

**Ethics approval and consent to participate:** Not applicable

**Consent for Publication:** Not applicable

**Availability of data and materials:** The datasets generated and analyzed during the current study are available in the Global Trade Alert repository, [https://www.globaltradealert.org/data\\_extraction](https://www.globaltradealert.org/data_extraction)

**Competing interests:** The authors declare that they have no competing interests.

**Funding:** Funding for this study was provided by the Rockefeller Brothers' Fund (RBF). RBF played no role in designing or conceiving of this study.

**Authors' contributions:** RT was a major contributor to the drafting and revising of the manuscript and made substantial contributions to the conception of the study. WK made substantial contributions to the design and conception of the study, oversaw the analysis and interpretation of the trade policy data, and substantively revised the manuscript. VJW made substantial contributions to the design and conception of the study, oversaw the analysis and interpretation of the trade policy data, and substantively revised the manuscript. LC and SPB made substantial contributions to the acquisition and analysis of the trade policy data. SP made substantial contributions to the conception of the study and was a major contributor to the drafting and revising of the manuscript. All authors have read and approved of this final manuscript.

**Acknowledgements:** We thank the Boston University Global Development Policy Center and the Boston University School of Public Health for their institutional support of our research. We also thank Kevin P. Gallagher, Director of the Boston University Global Development Policy Center for convening the group and providing institutional oversight.

## References

1. Assefa, Y., Gilks, C.F., Reid, S., van de Pas, R., Gete, D.G., and Damme, W.V. (2022). "Analysis of the COVID-19 pandemic: lessons towards a more effective response to public health emergencies." *Globalization and Health*, vol. 18:10. DOI: 10.1186/s12992-022-00805-9.
2. Baker, B. (6 June 2021) "The Impracticality of Relying Compulsory Licenses to Expand Production Capacity for COVID-19 Vaccines" Health GAP. Available at <https://healthgap.org/the-impracticality-of-relying-on-compulsory-licenses-to-expand-production-capacity-for-covid-19-vaccines/> (visited 3 Nov 2021).
3. Baker, B. (Mar. 16, 2022). "The Quad TRIPS Waiver Text is not a Compromise; It is an Abomination." HealthGAP blog. Available at <https://healthgap.org/the-quad-trips-waiver-text-is-not-a-compromise-it-is-an-abomination/> (accessed June 9, 2022).
4. Baldwin, R.E., 1989. Measuring nontariff trade policies. NBER Working Paper Series, No. 2978. Available at [https://www.nber.org/system/files/working\\_papers/w2978/w2978.pdf](https://www.nber.org/system/files/working_papers/w2978/w2978.pdf) (accessed April 15, 2022).
5. Bartels, L. & Paddeu, F. (Eds). 2020. *Exceptions in International Law*. Oxford University Press.
6. Bartels, L. 2015. The Chapeau of the General Exceptions in the WTO GATT and GATS Agreements: A Reconstruction, *American Journal of International Law*, vol. 109, pp. 95-125.
7. Bernasconi-Osterwalder, N. 2014. State-State Dispute Settlement in Investment Treaties. IISD Best Practices Series, Oct. 2014. <https://www.iisd.org/system/files/publications/best-practices-state-state-dispute-settlement-investment-treaties.pdf>
8. Bown, C. P., & Bollyky, T. J. (2021). How COVID-19 vaccine supply chains emerged in the midst of a pandemic. *Peterson Institute for International Economics Working Paper*, (21-12).
9. Buckholtz, A. (2021) "Inside Africa's Push to Make its Own Medicines: Regional pharma manufacturing hubs can expand the availability of drugs lower costs and strengthen local health systems" International Finance Corporation, World Bank Group. Available at [https://www.ifc.org/wps/wcm/connect/news\\_ext\\_content/ifc\\_external\\_corporate\\_site/news+and+events/news/cm-storharmerica-pharma-manufacturing-hubs-en](https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/cm-storharmerica-pharma-manufacturing-hubs-en) (visited 7 Nov 2021).
10. Commission on Health Research for Development (1990) "Health Research: Essential Link to Equity in Development" New York: Oxford University Press. Available at: [http://www.cohred.org/downloads/open\\_archive/ComReports\\_0.pdf](http://www.cohred.org/downloads/open_archive/ComReports_0.pdf) (visited 3 Nov 2021).

11. Crawford, J. and B. Kotschwar. 2020. "Chapter 5: Investment" in Handbook of Deep Trade Agreements (Aaditya Mattoo, Nadia Rocha and Michele Ruta (eds)), pp. 143-176. Washington, D.C.: World Bank.
12. de Melo, L., & Otávio, M. (2017). Host states and state-state investment arbitration: strategies and challenges. *Braz. J. Int'l L.*, 14, 81.
13. Platzer, M.D. and Mallett, W.J. 2019. Effects of Buy America on Transportation Infrastructure and U.S. Manufacturing. Congressional Research Service, Prepared for Members and Committees of Congress, R44266. Available at [https://www.everycrsreport.com/files/20190702\\_R44266\\_1ed2c08909229f66b3e3b1573f351aef46b6f145.pdf](https://www.everycrsreport.com/files/20190702_R44266_1ed2c08909229f66b3e3b1573f351aef46b6f145.pdf) (accessed April 13, 2022).
14. Evenett, S.J. (2019) Protectionism, state discrimination, and international business since the onset of the Global Financial Crisis *Journal of International Business Policy* 2: 9–36.
15. Evenett, S. J. (2020). Sicken thy neighbour: The initial trade policy response to COVID-19. *The World Economy*, 43(4), 828-839
16. Simon J. Evenett and Johannes Fritz (2019). The Global Trade Alert database handbook. Manuscript, 3 February 2020. [https://www.globaltradealert.org/data\\_extraction](https://www.globaltradealert.org/data_extraction)
17. Gaviria, M. and Kilic, B. (2021) A network of mRNA COVID-19 vaccine patents *Nature Biotechnology* 39: 546-548.
18. Goldman, A. and Balasubramaniam, T. (17 Aug 2015) "Switzerland pressures Colombia to deny compulsory license on imatinib" *Knowledge Ecology International*. Available at <https://www.keionline.org/22864> (visited 3 Nov 2021).
19. Gurgula, O. (2021) "Compulsory licensing vs. the IP waiver: what is the best way to end the COVID-19 pandemic" South Centre Policy Brief No. 104. Available at [https://www.southcentre.int/wp-content/uploads/2021/10/PB104\\_Compulsory-licensing-vs.-the-IP-waiver\\_EN-2.pdf](https://www.southcentre.int/wp-content/uploads/2021/10/PB104_Compulsory-licensing-vs.-the-IP-waiver_EN-2.pdf) (visited 1 Nov 2021).
20. "Highlights of the 17-year Airbus, Boeing trade war" *Reuters World* (15 June 2021). Available at <https://www.reuters.com/world/highlights-17-year-airbus-boeing-trade-war-2021-06-15/> (visited 3 Nov 2021).
21. Horn, Henrik (2018). Investor-state vs. state-state dispute settlement, IFN Working Paper, No. 1248, Research Institute of Industrial Economics (IFN), Stockholm (arguing that though state-state disputes will result in lower enforcement of the agreement or more policy space, it would produce more (economic) efficiency to allow ISDS and just change the substantive commitments of the country) <https://www.econstor.eu/bitstream/10419/210889/1/1042466459.pdf>
22. Horner, R. (2021) "Global value chains, import orientation, and the state: South Africa's pharmaceutical industry" *Journal of International Business Policy*. Available at <https://doi.org/10.1057/s42214-021-00103-y> (visited 1 Nov 2021).
23. Kanth, D.R. (21 Oct 2021) "US proposes 'peace clause' for disputes concerning IPRs at WTO" *TWN Info Services on Intellectual Property Issues*. Available at [https://twon.my/title2/intellectual\\_property/info.service/2021/ip211012.htm](https://twon.my/title2/intellectual_property/info.service/2021/ip211012.htm) (visited 3 Nov 2021).
24. Keenan, J. (23 Sept 2021) "Vaccine players in Argentina, Brazil selected as regional producers for COVID-19 shots" *Fierce Pharma*. Available at <https://www.fiercepharma.com/manufacturing/health-group-picks-sites-argentina-and-brazil-as-regional-hubs-producing-covid-19> (visited 7 Nov 2021).
25. Knowledge Ecology International (May 12, 2022). President Biden announces agreement between the NIH and the WHO COVID-19 Technology Access Pool (C-TAP). Available at <https://www.keionline.org/37782> (access June 9, 2022).
26. Labonté, R., Johri, M., Plamondon, K. *et al.* (2021) Canada, global vaccine supply, and the TRIPS waiver *Canada Journal of Public Health* 112: 543–547 (2021). Available at <https://doi.org/10.17269/s41997-021-00541-4> (visited 3 Nov 2021).

27. Medecins Sans Frontieres (MSF) Timeline of US Pressure on India. Available at [https://msfaccess.org/sites/default/files/2018-10/IP\\_Timeline\\_US%20pressure%20on%20India\\_Sep%202014\\_0.pdf](https://msfaccess.org/sites/default/files/2018-10/IP_Timeline_US%20pressure%20on%20India_Sep%202014_0.pdf) (visited 3 Nov 2021).
28. MSF Access Campaign, Compulsory Licenses, the TRIPS Waiver and Access to COVID-19 Medical Technologies (2021), <https://msfaccess.org/compulsory-licenses-trips-waiver-and-access-covid-19-medical-technologies> (last visited Jan 7, 2022)
29. MSF Statement, "Lack of real IP-waiver on COVID-19 tools is a disappointing failure for people (2022), <https://www.msf.org/lack-real-ip-waiver-covid-19-tools-disappointing-failure-people> (visited July 11, 2022).
30. Moran, N. 2017. The first twenty cases under GATT article XX: tuna or shrimp dear? In *International Economic Law: contemporary issues* (Adinolfi, G., Baetens, F., Caiado, J., Lupone, A. and Micara, A.G., eds.) Springer International Publishing: Switzerland, pp. 3-21.
31. New, W. (2019) "Malaysia Still Under Pressure to Make Hepatitis C Medicine More Expensive" *Intel lectual Property Watch*. Available at <https://www.ip-watch.org/2019/02/13/malaysia-still-pressure-make-hepatitis-c-medicine-expensive/> (visited 3 Nov 2021).
32. Nolen, S. (22 Oct 2021) "Here's Why Developing Countries can make mRNA COVID vaccines" *New York Times*. Available at <https://www.nytimes.com/interactive/2021/10/22/science/developing-country-covid-vaccines.html> (visited 2 Nov 2021).
33. Perehudoff, K., 't Hoen, E., Boulet, P. (2021) Overriding drug and medical technology patents for pan demic recovery: a legitimate move for high-income countries, too *BMJ Global Health* Commentary, 6(4): 1-4. Available at doi:10.1136/bmjgh-2021-005518 (visited 1 Nov 2021).
34. Okediji, R.L. 2014. Is intellectual property investment: Eli Lilly v. Canada and the International Intellectual Property System. 35(4) *University of Pennsylvania Journal of International Law*. 1121-1138.
35. Peacock, S.J. (2022). "Vaccine nationalism will persist: global public goods need effective engagement of global citizens." *Globalization and Health*, vol 18:14. DOI: 10.1186/s12992-022-00802-y.
36. Phillips, W., Roehrich, J.K., Kapletia, D., Alexander, E. (2022). Global Value Chain Reconfiguration and COVID-19: Investigating the case for more resilient redistributed models of production. *California Management Review*, vol. 64(2), pp. 71-96.
37. Rackimuthu, S., Narain, K., Lal, A., Nawaz, F.A., Mohanan, P., Essar, M.Y., Ashworth, H.C. (2022). "Redressing COVID-19 vaccine inequity amidst booster doses: charting a bold path for global health solidarity, together." *Globalization and Health*, vol. 18:23. DOI: 10.1186/s12992-022-00817.
38. Rahman, M. Wirtz, V.J., Kaplan, W.A., Thrasher, R.D., Gallagher, K.P. (Sept 2021) Policy Space for Building Production Capabilities in the Pharmaceutical Sector in Low- and Middle-Income Countries: Evidence from Bangladesh *GDP Center, GEGI Working Paper 051*. Available at [https://www.bu.edu/gdp/files/2021/09/GEGI\\_WP\\_051\\_FIN.pdf](https://www.bu.edu/gdp/files/2021/09/GEGI_WP_051_FIN.pdf) (visited 3 Nov 2021).
39. Reinsch, W.A., Hoffner, J., Caporal, J. (10 April 2020) "A World in Crisis: Will Buying American Help or Hurt?" Center for Strategic & International Studies, Critical Questions. Available at <https://www.csis.org/analysis/world-crisis-will-buying-american-help-or-hurt> (visited 3 Nov 2021).
40. Rizvi, Z. (10 Aug 2021) "Sharing the NIH-Moderna Vaccine Recipe" *Public Citizen*. Available at: <https://www.citizen.org/article/sharing-the-nih-moderna-vaccine-recipe/> (visited 8 Nov 2021).
41. Sashikant, S. (19 Oct 2021) "Intellectual Property Monopolies Perpetuate Inequitable Access to COVID-19 Therapeutics" *Third World Network*. Available at [https://www.twn.my/title2/intellectual\\_property/info.service/2021/ip211011.htm](https://www.twn.my/title2/intellectual_property/info.service/2021/ip211011.htm) (visited 3 Nov 2021).

42. Schultz, T. and Dupont, C. (2014) Investment Arbitration: Promoting the Rule of Law or Over-Empowering Investors? A Quantitative Empirical Study *European Journal of International Law*, 25(4): 1147-68.
43. Srari, J.S., Graham, G., Hennelly, P., Phillips, W., Kapletia, D., Lorentz, H. (2020). Distributed Manufacturing: A new form of localized production? *International Journal of Operations and Production Management*, vol. 40, issue 6, pp. 697-727.
44. Stolberg, S.G. and Robbins, R. (9 Nov 2021) "Moderna and US at Odds Over Vaccine Patent Rights" *The New York Times*. Available at <https://www.nytimes.com/2021/11/09/us/moderna-vaccine-patent.html> (visited 12 Nov 2021).
45. Suneja, K. (27 June 2019) "India wins solar case against the US in WTO" *The Economic Times Industry*. Available at <https://economictimes.indiatimes.com/industry/energy/power/wto-panel-rules-in-indias-favour-in-renewable-energy-case-against-us/articleshow/69978672.cms?from=mdr> (visited 3 Nov 2021).
46. Sweet, A.S., Chung, M.Y., Saltzman, A. (2017) Arbitral Lawmaking and State Power: An Empirical Analysis of Investor–State Arbitration *Journal of International Dispute Settlement* 8(4): 579-609.
47. Thanvi, A. (23 Oct 2020) "Bit by bit to a big leap: India and the ISDS reforms" *The Daily Guardian*. Available at: <https://thedailyguardian.com/bit-by-bit-to-a-big-leap-india-and-the-isds-reforms/> (visited 4 Nov 2021).
48. Thrasher, R.D., Sklar, S., Gallagher, K.P. (2019) "Quantifying Policy Space for Regulating Capital Flows in Trade and Investment Treaties" G-24 Working Paper. Available at [https://www.g24.org/wp-content/uploads/2019/03/Gallagher\\_Capital\\_Flows\\_and\\_Treaties.pdf](https://www.g24.org/wp-content/uploads/2019/03/Gallagher_Capital_Flows_and_Treaties.pdf) (visited 3 Nov 2021).
49. C. Moehlecke, R. L. Wellhausen, Political Risk and International Investment Law. *Annu. Rev. Polit. Sci.* **25**, annurev-polisci-051120-014429 (2022).
50. United Nations Conference on Trade and Development (UNCTAD), "International Investment Agreements Navigator" (UNCTAD 2022; <https://investmentpolicy.unctad.org/international-investment-agreements>)
51. Vincent, Nicholas, TRIP-ing Up: The Failure of TRIPS Article 31bis (2020). *Gonzaga Journal of International Law* 2020, Available at SSRN: <https://ssrn.com/abstract=3778945>
52. World Trade Organization (WTO) (2020). Waiver from Certain Provisions of the TRIPS Agreement for the Prevention, Containment and Treatment of COVID-19: Communication from India and South Africa. Available at <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669.pdf> (visited May 31, 2022).
53. WTO 2022. General Council News: "Members welcome Quad-document as basis for text-based negotiations on pandemic IP response." Available at [https://www.wto.org/english/news\\_e/news22\\_e/gc\\_10may22\\_e.htm](https://www.wto.org/english/news_e/news22_e/gc_10may22_e.htm) (accessed May 31, 2022).
54. WTO (June 17, 2022). "Ministerial Decision on the TRIPS Agreement." WT/MIN(22)/30; WT/L/1141. Available at <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN22/30.pdf&Open=True> (visited July 11, 2022).
55. World Health Organization (WHO) (2012). "Research and Development to Meet Health Needs in Developing Countries: Strengthening Global Financing and Coordination." Report of the Consultative Expert Working Group on Research and Development: Financing and Coordination. Available at <https://apps.who.int/iris/bitstream/handle/10665/254706/9789241503457-eng.pdf> (visited July 11, 2022).
56. WHO (2020) Solidarity Call to Action. Available at <https://www.who.int/initiatives/covid-19-technology-access-pool/solidarity-call-to-action> (visited 24 Aug 2021).
57. World Intellectual Property Organization (WIPO) (2021) COVID-19 Policy Tracker. Available at <https://www.wipo.int/covid19-policy-tracker/#/covid19-policy-tracker/access> (1 Nov 2021).
58. *International Law Resources*
59. General Agreement on Tariffs and Trade (GATT), Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194.

60. Agreement on Trade-Related Investment Measures (TRIMs), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1868 U.N.T.S. 186
61. Agreement on Subsidies and Countervailing Measures (SCM), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1869 U.N.T.S. 14
62. Agreement on Government Procurement (GPA), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 4(b), 1915 U.N.T.S. 103.
63. Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197 (1994).
64. Canada-Australia-Brunei-Chile-Japan-Malaysia-Mexico-New Zealand-Peru-Singapore-Viet Nam (CPTPP). 2018. "Comprehensive and Progressive Agreement for Trans-Pacific Partnership." Government of Canada. <https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/ agr-acc/tpp-ptp/text-texte/toc-tdm.aspx?lang=eng> (visited 7 Nov 2021).
65. Association Agreement between the European Union and its Member States, of the one part, and Ukraine, of the other part. *Official Journal* L 161, pp. 3-2137 (29 May 2014). Available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A22014A0529%2801%29> (visited 4 Nov 2021).
66. United States-Mexico-Canada Agreement (USMCA), U.S.-Mex.-Can., agreed to 1 Oct 2018. Available at [https://ustr.gov/sites/default/files/files/agreements/FTA/USMCA/Text/20\\_Intellectual\\_Property\\_Rights.pdf](https://ustr.gov/sites/default/files/files/agreements/FTA/USMCA/Text/20_Intellectual_Property_Rights.pdf) (visited 4 Nov 2021).
67. Regional Comprehensive Economic Partnership (RCEP), agreed to 15 Nov 2020. Available at <https://rcepsec.org/legal-text/> (visited 4 Nov 2021).
68. WTO, 'Article XX General Exceptions' (n.d.). Available at [https://www.wto.org/english/res\\_e/booksp\\_e/gatt\\_ai\\_e/art20\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art20_e.pdf) (visited 4 Nov 2021).
69. Appellate Body Report, *European Communities and Certain member States – Measures Affecting Trade in Large Civil Aircraft*, WTO Doc. WT/DS316/AB/R (adopted 18 May 2011)
70. Appellate Body Report, *United States – Final Countervailing Duty Determination with respect to certain Softwood Lumber from Canada*, WTO Doc WT/DS257/AB/R (adopted 19 Jan 2004).
71. Appellate Body Report, *India – Certain Measures Relating to Solar Cells and Solar Modules*, WTO Doc WT/DS456/AB/R (adopted 16 Sept 2016).
72. Panel Report, *United States – Certain Measures Relating to the Renewable Energy Sector*, WTO Doc WT/DS510/AB/R (circulated 27 June 2019).

## Figures



**Figure 1**

**Health Sector intervention types according to country income level**