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In Peripheral Sickness and in Core-like Health:

An explorative case study analysis of the Covid-19 pandemic using World-Systems Theory

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Abstract

The Covid-19 pandemic is one of the deadliest in modern history. Vaccines are currently the primary resource used for stopping the pandemic and minimizing harm. Yet despite scientific literature demonstrating the inefficiency of inequitable vaccine distribution, richer countries have historically and are currently procuring disproportionate amounts of vaccines; causing higher mortality rates, decreased global economic activity and increased risk of viral mutations. This exploratory and qualitative case study aims to understand the unequal distribution of vaccines during the Covid-19 pandemic from a World-Systems Theory approach. This is done through the process of applying World-Systems Theory on the geography of vaccine production and acquisition, vaccine nationalism, intellectual property, and global health governance. The findings of this paper demonstrates that the world-system's pursuit of endless capital accumulation causes inequitable distributions of production processes that both maintain unequal flows of surplus value but also concentrate leading industries in the core while depriving the periphery of the ability to establish them. Vaccine development, production and procurement is demonstrated to occur mainly in the core, an outcome detrimental to all.

Keywords: Vaccine nationalism, World-Systems Theory, Covid-19, Global Health Equity

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“[The promise] of equitable access is at serious risk. We now face the real danger that even as vaccines bring hope to those in wealthy countries, much of the world could be left behind.”

– Director-General Tedros Adhanom warning against vaccine nationalism

Edward Murrow: “Who owns the patent on this [polio] vaccine?”

Jonas Salk: “Well, the people, I would say. This is – could you patent the sun?”

– Dr. Jonas Salk on who owned his invention

Dedicated to the memory of Professor James Zhijian Shen, one of the author’s father, who passed away during the writing of this paper. Like millions of others, he left us too soon, his life cut short due to Covid-19. We would like to honor all the victims of this deadly virus and the inadequate policies and actions to address it. Our hearts go out to all the grieving families who have lost a loved one.

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1. Introduction

1.1. Background

There is no country nor individual that has been left unaffected by the Covid-19 pandemic. At the time of writing the confirmed death toll is north of 3 million, making it one of the deadliest pandemics in history (Ives et al. 2021). Seeing vaccines as the most important resource for stopping the pandemic and minimizing its damage, states have invested great monetary sums in the research and development of various candidates. However, with several vaccines having been authorized and approved internationally, there have been grave concerns raised that the nationalistic process of acquisition is creating an inequitable¹ distribution which will prolong the global crisis to the detriment of all: including those states procuring disproportionately large quantities (Bollyky–Bown 2020).

The phenomenon of *vaccine nationalism* is not unique for the Covid-19 pandemic; similar tendencies can be observed in previous global health crises. Concern about the unequal distribution of vaccines during the Covid-19 pandemic has been expressed by many but acted upon by few. Nearly 700 million doses of vaccines have been produced and most of them have been bought up by – and distributed to – richer and vaccine-producing countries (Haslinda et al. 2021). Several international actors have taken initiative to create and develop ways to combat this problem, and in the process try to ensure equitable access to Covid-19 medical resources. COVAX, a pillar of the World Health Organisation (WHO) led collaboration, namely The Access to Covid-19 Tools (ACT) Accelerator, is the primary example of international collaboration on a global scale, during this pandemic (WHO 2021). The initial aim for COVAX is to serve as a supporting platform for researchers, manufacturers, and developers of Covid-19 medical resources, and by the end of 2021 have made 2 billion doses of vaccines available to individuals at high risk as well as frontline healthcare workers globally (Berkley 2020).

Although this initiative has gained widespread support in the global arena, it is having difficulties to meet its aim (Cheng 2021). A few participating countries in COVAX together constitute most of the purchases and hoarding of vaccine doses in the world, and while they pledge to donate vaccine doses to the program, they still priorities safeguarding enough for domestic use.

¹ This paper will in its analysis include words such as equity and equitable, normative words often carrying meanings such as “fair” and “impartial”. This makes values and biases (that all researchers have) clear to the reader so there is transparency regarding how our conclusions are affected and reached. We thus make it clear that for example the unequal distribution of vaccines is regarded as socially undesirable and that we, the authors, wish to address the issue and support the creation of solutions against it.

The demand for vaccines in the world is evidently exceeding the supply, and by having bilateral purchase agreements with vaccine producers, high-income countries (HIC) noticeably have a better ability to access and utilize Covid-19 medical resources, leaving poorer countries to play the waiting game of when they will be able to get vaccinated (Kay et al. 2021).

The current Covid-19 pandemic is not a unique event; world-wide pandemics have occurred before and scientific literature suggests that they will become more frequent, spread faster, and have higher death tolls due to the same processes causing and accelerating biodiversity loss and climate change (IPBES 2020). These events can thus no longer be thought of as anomalous or unforeseeable. Instead, such *global health crises* are inevitable and inherent to the system with which our societies are organized: the world-system and its capitalist world-economy. Previous global health crises also show patterns that are observable in the Covid-19 pandemic and will presumably appear in future crises if one assumes the continuation of the current system. Two such crises are the H1N1 and HIV/AIDS pandemics which will be shortly described.

In 2009 the H1N1 virus emerged and spread at worrying speeds, prompting fears of a potentially world-wide pandemic. Vaccines appeared to be the only meaningful way of preventing infection and through advance purchase agreements (APA) richer countries laid claim to virtually all the world's total production capacity; the US which constituted around 4.5% of the world population placed orders of 600 million doses, potentially 60% of the global production capacity (Brown 2009). Appeals by WHO and the United Nations (UN) resulted in donation pledges of surplus amounts that still left poorer countries with limited supplies to protect their populations, pledges which were made only after it was discovered that a single dose (not two) were needed for immunization and the virus was proven to be less deadly than feared. Inequity became a point of contention with negotiations failing due to wealthier states wishing to avoid obligations to provide benefits (e.g., vaccines, antiretrovirals) in exchange for virus samples given by poorer countries, and to avoid forfeiting the ability to make advance purchases of vaccines; in doing so going against the demands and needs of poorer states (Fidler 2010).

The HIV/AIDS crisis has been one of the deadliest in modern history with over 32.7 million deaths since its beginning, of which 690 000 died in 2019. While the mortality rate has decreased substantially in recent years this is still an unsettling figure, especially considering that 12 million (out of 38 million) of individuals currently living with HIV are not receiving antiretroviral treatment (UNAIDS 2020). Such deaths are needless as lifesaving medications for treatment have existed for decades and while significant progress has been made, this has been despite intellectual property (IP) rights that hamper the proliferation of and access to such lifesaving medicines. The Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement of 1994 required member-states of the World Trade Organization (WTO) to implement a minimum standard of IP rights (including 20-year patents on pharmaceutical products); ending the diversity of patent

policies and practices among these different states who often had restrained pharmaceutical patent laws or actively excluded them since such patents were not deemed to be in the public interest (Hoen et al. 2011). While the TRIPS agreement did not focus on public health it contained flexibilities to remedy issues caused by patents such as compulsory licensing whereby a license is given to a producer in exchange for “adequate remuneration” to the patent holder. In an unprecedented move, the Doha Declaration of 2001 confirmed that the agreement “can and should be [interpreted in a manner] supportive of WTO members’ right to protect public health [and to promote] access to medicine for all” (WTO 2001). However, while it is important to appreciate the use of compulsory licensing and acknowledgement of health issues, such progress has been made despite relentless pressures to strengthen IP laws regardless of societal consequences. The policy space to use TRIPS flexibilities has continually been constrained by IP requirements in bilateral agreements that exceed TRIPS (called “TRIPS-plus”); particularly middle-income developing countries with lucrative emerging markets have been heavily pressured not to use TRIPS flexibilities (Hoen et al. 2011).

Generics, drugs equivalent to originally patented pharmaceuticals, are produced at substantially lower prices than those made by originator companies thus allowing treatment of those otherwise unable to pay, and the importance of generic drugs, especially from India, in combating HIV cannot be understated. India’s sizeable generics industry produced over 80% of antiretroviral purchased (Waning et al. 2010), over 80% of HIV medicines used by Médecins Sans Frontières (MSF) and has helped reduce the cost of such medicines by 99% since 2000 (MSF 2015); thus, being dubbed “the pharmacy of the developing world”.

1.2. Purpose and research question

Unequal distribution of medical goods is a recurring problem during global health crises. Initiatives for global cooperation are argued by many to be the most efficient way to end a global pandemic, quickly. However, the tendency of HICs to hoard medical resources during times of crisis makes global health inequity and its associated, far-reaching consequences inevitable. The purpose of this paper is thus to understand and problematize the unequal distribution of medical resources during a global health crisis by analyzing the Covid-19 pandemic. To understand this problem, we have chosen to use the theoretical framework of World-Systems Theory (WST), which will give us a perspective of how the world is systematically structured and its effects on how countries and international actors act on the global arena. The findings from our study could in a broader spectrum contribute to the body of research in IR pertaining to global health, particularly political patterns during global health crises. The analysis in this paper could also complement existing research in this field, by the contribution of a new angle of approach through WST.

The research question for this paper is thus:

- *In a global context, how can inequitable access to medical resources be understood and problematized through World-Systems Theory?*

1.3. Previous studies

Previous research in this field of International Relations (IR) has mostly involved studies about the phenomena of *vaccine nationalism*.

Bollyky and Brown (2020) have done a thorough explanation and problematization of vaccine nationalism, where they shine light on the phenomena as a hindering factor for an effective distribution of vaccines. The “my country first” approach these richer states have had during past and current global health crises have been problematized with the reasoning that it disfavors *all* countries (Bollyky–Brown 2020). States who acquire vaccines in excess gain diminishing utility since increased immunization lessens the need for additional vaccines; every vaccine decreases the rate of total infection until the population reaches “herd immunity” which is generally thought to be an immunization rate around 70%. These explanations in their article can also be supported by statistics from other studies that show that the remaining states are subsequently not able to immunize their own population – which make up most of the global population – and thus the world suffers a death toll up to twice as high and potentially a loss of trillions of dollars in economic activity due to inequitable vaccine distribution (Chinazzi et al. 2020; Çakmaklı et al. 2021). Moreover, in their article, Bollyky and Brown (2020) further problematizes the phenomena of vaccine nationalism by drawing parables to the H1N1 virus (more commonly known as Swine flu) pandemic. As this article was published at the beginning of the Covid-19 pandemic, the main emphasis was put on the importance of states to not act accordingly to the phenomena of vaccine nationalism for this pandemic, as they had during previous ones.

Another study on the inequitable access of vaccines during the H1N1 pandemic is the one done by Fidler (2010). Emphasis is placed on the difficulties of negotiating equitable access of influenza vaccines, due to HICs prioritizing their national self-interests. The emergence of a more severe influenza strain, like the H1N1 virus in 2009, evidently did not lead to collaboration being favored over nationalism. The article concluded that nationalistic behavior will continue to make the diplomatic endeavor of vaccine equity difficult in future crises.

This paper will be one of the first attempts using WST to propose possible causes and driving factors of vaccine nationalism, and in turn the inequitable distribution of medical goods during a global health crisis. Previous research and studies in IR pertaining to global health, as well as the thorough explorations of the phenomena vaccine nationalism, aids this paper by

establishing a theoretical foundation from which further research can be done. The fact that this area of study about global health equity, despite some previous research, still contains significant knowledge gaps provides legitimacy for the interdisciplinary aim of this study.

2. Theoretical framework

2.1. World-Systems Theory

Immanuel Wallerstein's theoretical approach diverges from traditional IR-theories in several aspects. Primarily by analyzing the *world-system* – instead of states – which is understood through structural time or *longue durée* with inspiration from the Annales School (Wallerstein 2004, 18-19). Additionally, the international system is not interpreted through the traditional lens of *anarchy*, instead the world-system in the form of a *capitalist world-economy*, which divides the world's states into *core* and *periphery*, gains explanatory primacy for patterns and processes of the international system.

The world-system and world-economy is not understood as a system or economy *of* the world, but as worlds *in and of themselves* whose extent are limited within a spatial and temporal zone within which activities and institutions are subject to systemic rules (Wallerstein 2004, 16-17). Indeed, there have been previous world-economies, but this modern one has survived the longest (since the 16th century) and thrived. Exactly because it has become fully capitalist (Wallerstein 2004, 17). This modern world-economy is understood to be a large geographic zone (which expands and contracts) containing a division of labor and thus exchanges of goods as well as flows of labor and capital. No unitary political structure exists within the world-economy, instead this zone cuts through several political and cultural units (e.g., states and nations) and while common patterns can be observed (geoculture), the structure is mainly unified by the division of labor which is constituted within it (Wallerstein 2004, 23).

Capitalism in WST is understood as neither the mere existence of production for the purpose of profits nor the existence of wage-labor. Instead, it is when the system gives priority to the *endless* accumulation of capital that it is deemed capitalistic, and the system “gives priority” through structural mechanisms that penalize actors motivated by other goals than profit, eventually leading to elimination (Wallerstein 2004, 24). The opposite is also true as profit-seeking actors are rewarded for this behavior and enriched if successful.

In principle this capitalist system operates upon a virtual free market, yet in practice this “free market” does not exist due to capitalistic profit-seeking and desire for accumulation. High competition, unrestricted flows and perfect information would in fact run counter to the incentives

of accumulation since consumers would negotiate to the point that any profit made would be miniscule (since the cost of production is known and the producer can be replaced if needed) which would remove “the basic social underpinnings of such a system” (Wallerstein 2004, 25-26). For the purposes of accumulation monopolies are preferred over competition since a wide profit-margin is thus made possible. However, perfect monopolies are highly difficult to create and maintain; thus, *quasi-monopolies* are pursued as the preferred method for accumulation of capital.

State interference is essential for the creation of quasi-monopolies, of which several mechanisms exist, the main one being the system of patents which leads to oligopolies of patented but similar *leading* (new and constitutes an important share of the market) products. Perfect monopolies would be preferable for the purposes of accumulation, but oligopolies still suffice for the realization of high rates of profits since there is a shared desire to minimize price competition, even to the point of collusion. Other state interferences are protectionist policies, subsidies, tax benefits and large-scale public purchasing (often over market prices). These quasi-monopolies are unstable as products become more competitive (i.e., less profitable) and then replaced by new leading products and/or industries, but during their life-cycle considerable capital is accumulated and moved to new quasi-monopolies in a perpetual cycle (Wallerstein 2004, 24-26). State interference also accounts for significant costs not internalized by private firms such as costs of toxicity (e.g., industrial waste, ecological damage), costs of material exhaustion (e.g., deforestation, overfishing) and costs of transport (e.g., infrastructure, roads, bridges).

The unifying division of labor in the world-economy thus creates *core-like* and *peripheral* products that differ in degree of monopolization (Wallerstein 2004, 28). Core-like products are controlled by quasi-monopolies and can generate large profits while peripheral products are highly competitive and surplus-value flows from producers of peripheral products to the producers of core-like products. Thus, it also flows from *weak* states (periphery) to *strong* states (core) that can facilitate and enforce quasi-monopolies and benefit from unequal exchanges (Wallerstein 2004). Furthermore, this flow includes the transfer of products and processes as quasi-monopolies are self-exhausting (become increasingly competitive) at which point new leading products or industries replaces it; core-like processes become peripheral, and the geographical shift reflects this as products and industries downgrade from core states to the periphery (Wallerstein 2004, 29).

This is the natural pattern in the world-system, but not a passive process. While capitalism as defined above leads to the creation of quasi-monopolies there are two main anti-monopolistic mechanisms. Since one producer’s monopolistic advantage is another’s loss there will always exist opposition that eventually dissolves the monopolistic advantage by either (i) engaging domestically by appealing to free market doctrines and supporting anti-monopoly actors or (ii) engaging internationally by persuading foreign states to defy world-market monopolies (Wallerstein 2004, 26-27).

Core and peripheral processes occur in all manner of countries, but accumulation also leads to these processes being concentrated in various states. As quasi-monopolies are dependent on the power of the state, and there is an incentive to keep such monopolies within one's state, the result becomes stronger states being able to promote their own interests and thus retain core processes within themselves while giving weaker states peripheral processes. Such a configuration leads to the perpetuation of the system: enriching the core and depriving the periphery of both wealth and ability to change the system. Thus, the system and status-quo are highly stable, explaining its achievement of surviving for centuries (Wallerstein 2004, 28).

WST regards these processes, core and peripheral, as the fundamental explanatory factors regarding the hierarchy and configuration of the world order and its states. Within this framework, states are perceived as basic units differing significantly only in the proportion of core and peripheral processes that they contain and maintain within themselves. The Global North is understood to have been the historical recipient of global surplus-value flows not due to any internal factors such as cultures or economic/political structures that are 'superior', but due to its initial establishment and subsequent maintenance of core processes in the North and peripheral processes in the South. Thus, the Global North and South is understood as having a core-periphery relationship. All states contain both processes to varying degrees, but core states contain a disproportionate share of core-like processes and vice versa while states with a relatively even mix are regarded as *semi-peripheries* (Wallerstein 2004, 29).

The role and ability of a state within the modern world-system depends on the proportion of processes it contains within itself: whether it is a core, periphery, or semi-periphery state. Core states prioritize the protection of their profitable quasi-monopolies, periphery states more or less have to accept their position and the resulting outflow of surplus-value created in the world-economy. Semi-peripheries have a more complex role of resisting the pressures and demands of the core while applying them to the periphery in the struggle to become core states (Wallerstein 2004, 29). This is done through extensive state interference in the form of protectionist policies that shield domestic firms from international competition, support the improvement of these firms and promote the relocation of former leading products into the country from core states (Wallerstein 2004, 29-30). This is done despite the interest of the core due to semi-peripheries being 'strong' enough to resist core pressures, which periphery states are incapable of doing.

The *strength* of states is an important factor for interpreting and explaining state behavior. It seems obvious that states vary in strength on the international arena: The US is stronger than Uganda; Nepal weaker than the Netherlands. Yet the exact meaning of such strength must be expanded upon, which Wallerstein does by describing it as "the ability to get legal decisions actually carried out" (Wallerstein 2004, 52-53). The decisions made by a state would thus result in compliance proportionate to its strength. An example would be the percentage of taxes levied

that are collected which would be low in a weak state due to a weak bureaucracy whose inability to gather funds consequently leaves it less capable to strengthen itself or perform other tasks both domestically and internationally (Wallerstein 2004, 53). State strength is also indicative of the state's ability to establish and enforce its sovereignty, the modern state's essential trait, and monopoly of legitimate violence (Wallerstein 2004, 42). Effective control of the country by a strong state means the inability (and unwillingness) of local actors or military forces to challenge state authority. Such control is not dependent on one having the 'right' policies, instead effective control is dependent on core processes that can constitute a tax base to fund the strengthening of the state structure; peripheral states that lack such processes are disadvantaged and find themselves in precarious situations where corruption is incentivized, and coups are significant threats (Wallerstein 2004, 53).

In addition to these material prerequisites, Wallerstein describes *nationalism* as "perhaps the most crucial" status-group identity for the maintenance of the modern world-system (Wallerstein 2004, 54). *Nation-states* are perceived as an ideal towards which all states aspire, even those who have highly diverse populations and claim to be "multi-national" such as the US (Americans), Canada (Canadians), Switzerland (Swiss) and the Soviet Union (Soviets). By turning "citizens" into "nations", states improve the effective control of their territories and production processes within: *nations* are socially constructed with states playing a central role in their creation (Wallerstein 2004, 54). One might then describe the modern state as nation-states and the primary identity of these as their respective *state-nations*.

States exist within an interstate framework meaning that strength is not only measured as the ability to exercise authority internally such as described above (internal strength), but also as the ability to affect, resist and coerce other states in the competitive environment of the world-system. External state strength is thus relative and – even though all states are supposedly sovereign – allows stronger states to more easily intervene in the affairs of weaker states to reinforce core-periphery linkages and promote their own interests. Such linkage reinforcement is done in multiple ways such as: imposition of uneven trade flows, promotion of certain cultural practices, pressure to install amenable individuals into power and pressure for weak states to follow the lead of strong states in international affairs (Wallerstein 2004, 55).

All states wish to become stronger for greater autonomy and ability to improve one's own condition, yet some states have at different times reached such high levels so as to be described as *dominant* and having obtained *hegemony* in the world-system; the latest one being the US since the mid-twentieth century (Wallerstein 2004, 57). Hegemonic powers have extraordinary capabilities to affect international politics by establishing the rules of the interstate system, allowing them to dominate the world-economy, achieve political goals with minimal force and affect the language used to discuss the world (Wallerstein 2004, 58). Hegemony is however a quasi-

absolute power and – just like quasi-monopolies – is self-exhausting as surrounding states become increasingly ‘competitive’, the power difference diminishes to the point of insignificance and rivals start challenging the hegemonic power in the hopes of replacing it and thereafter reaping the rewards (Wallerstein 2004, 58). All the while capitalist enterprises benefit and thrive under the rule of changing hegemonic powers (Wallerstein 2004, 58-59).

This world-system has existed for centuries, the longest of any world-system, yet it also has a finite lifespan. World-systems eventually encounter problems that are impossible to solve within its own framework, thus constituting a *systemic crisis* which can only be resolved by and result in the establishment of a new world-system formed by the collective actions of all involved parties (Wallerstein 2004, 77-78). Wallerstein argues that the modern world-system is undergoing such a crisis due to the increase of production costs (i.e., remuneration, inputs, taxation) and the disillusionment with old antisystemic forces (Wallerstein 2004, 83-84). Exactly when this crisis truly started will be hotly debated, but Wallerstein proposes the world protests of 1968 as an important point in history, due to their failure. These explosive protests lead to little change despite antisystemic movements (e.g., workers rights, gender equality, anticolonialism) finally having come to power: the optimism of the oppressed – a crucial stabilizer of the world-system – is now gone (Wallerstein 2004, 84-85). Creeping improvements no longer suffice; the capitalist world-economy can be relied upon no longer by the exploited and neglected to truly improve their lives.

In response to 1968 there was an Establishment attempt to address the problem of production costs by reversing the trend in all three components of cost: remuneration would be lowered, costs of inputs re-externalized and taxation for the welfare state (which funded education, healthcare and income guarantees) reduced. Globalization replaced developmentalism with the International Monetary Fund (IMF; alongside the World Bank) and WTO enforcing the “Washington consensus” through structural adjustment programs; reducing global production costs (with significant social impacts) but not enough to end the profit squeeze threatening the world-economy (Wallerstein 2004, 86). These trends in production costs (i.e., decreased profitability in production) have also led to increased activity in financial speculation as capitalists seek new ways to profit and accumulate capital, which has worked for a limited set of actors but has rendered the world-economy increasingly volatile and chaotic (Wallerstein 2004, 86).

3. Method and material

3.1. Case Study method

This paper will utilize a qualitative case study research method as defined by Yin (2014, 16). The chosen method is motivated by Yin (2014) as a case study method is described to be the most preferred method for research questions beginning with “how” and consequently have the characteristics of being explanatory. A case study method is also motivated to be more beneficial than other research methods when the focus of the study is to analyze a contemporary phenomenon (Yin 2014). As the purpose of this paper is to shed light on as well as problematize the unequal distribution of medical goods during global crises, by specifically looking at the Covid-19 pandemic as a case, utilizing a case study method is therefore suitable. The choice of conducting a single-case study is further motivated when the purpose of a study is to be theory consuming (Esiasson et al. 2017, 42). Due to the lack of previous studies in the discipline of IR in the context of global health, an exploratory approach is justified and will contribute to the discipline’s recent entry into a new field of research.

Moreover, utilizing WST would also be an academic contribution as this is a scarcely used framework. This paper will have the approach of being theory consuming and aim to utilize this theoretical framework to find explanatory factors, as well as deepening our understanding of the problem of inequitable access to medical resources during crises in a global context. Operationalisations and definitions of key concepts within WST will be applied to our chosen case. This analysis will rely on these concepts to assess the unequal distribution of vaccines during the Covid-19 pandemic. Although results from a case study are commonly said to be harder to generalize, we see potential for our study’s results to be reproduced under similar conditions.

3.2. Case selection

To adequately answer our research question this paper will use the Covid-19 pandemic as a case of inequitable access of medical resources during a global health crisis. This choice of case is done mainly due to the fact that the Covid-19 pandemic is the most recent global health crisis we can observe, where unequal distribution of vaccines is an evident problem. The Covid-19 pandemic is prevalent in our daily lives as of now, and thus it is a very socially relevant topic of discussion. It is also highly relevant from an analytical perspective as one could possibly generalize the conclusions to fit previous pandemics, as well as future ones. Even though this pandemic has its own unique qualities, in a broader spectrum, it can be a representative case of the political patterns for how global actors and states react during times of a global health crisis. Since these political

patterns can be observed from previous pandemics, a focus on the Covid-19 pandemic will allow this paper to better understand the underlying mechanisms specific to the case at hand.

3.3. Definitions and operationalisations

3.3.1. Categorization of Countries into World-Systems Theory

Based on Wallerstein’s WST, we primarily seek to find structural explanations for the difficulties of accomplishing a globally equal distribution of Covid-19 vaccines. In order to do this, we have categorized different countries as either core or periphery using Wallerstein's (2004) classification of countries. Accordingly, we have used statistics from the World Bank classification of countries for the fiscal year of 2021, as well as already existing classifications by the Duke Global Health Innovation Centre (World Bank 2021; Duke Global Health Innovation Centre 2021a). For the purpose of this paper, we have based our categorization on the premise that countries in the core are equivalent to HICs on the World Bank’s list. In order to get a general picture of the situation, we have thus chosen to categorize HICs as the core and both middle- and low-income countries in the periphery.

It is worth noting that we have chosen not to include the WST category semi-periphery. The reasoning behind this is based on the different WST categories' relationship to vaccines and if it can be identified as a core or peripheral process. States that would qualify to be in the semi-periphery have a similar relationship to vaccines as states in the periphery. In the context of Covid-19 vaccines, the only positive pattern of distribution can be located within the core-processes, which is applicable to core nations. Countries categorized as in the semi-periphery and periphery are both at a disadvantage, regarding the distribution of vaccines. Thus, an addition of a third category, semi-periphery, would not impact these processes nor would it change the results and analysis of this paper.

Table 1. Categorization of Countries into World-Systems Theory.

WST Category	Countries categorized
Core	Australia, Canada, Denmark, France, Germany, Japan, Norway, Singapore, Sweden, Switzerland, United Kingdom, United States
Periphery	Afghanistan, Brazil, Bolivia, Chad, Ethiopia, Haiti, India, Mali, Mexico, Nepal, Rwanda, Sudan, Syria, Thailand, Philippines, Uganda, Vietnam, Yemen

In Table 1 we have given some examples of countries that are categorized into the two classifications. In our analysis we will primarily use these classifications as a guideline and general picture of how WST can be used to explain nations actions in regards to the distribution and production of Covid-19 vaccines.

3.3.2. **Hoarding of vaccines as accumulation of capital**

The hoarding of vaccines by high-income countries has been widely criticized as a harmful and self-defeating strategy, but one might struggle to explain this phenomenon through the lens of WST. This difficulty can be circumvented by understanding the capitalistic tendency towards accumulation as a utility-maximizing practice. Accumulation is done for the purpose of continued accumulation, yet it does not make sense to accumulate capital for the sake of itself. If one understands the accumulation of capital as a practice done to increase one's own utility, then the act of vaccine hoarding is simply another form of accumulation done by core states.

3.3.3. **Patented vaccines as core-like products**

Utilizing Wallerstein's interpretation of products in their degrees of monopolization, vaccines can be understood as core-like products, i.e., with a high degree of monopolization and thus profitability. This implies that vaccines *when protected by patents* are non-competitive with a limited number of actors – an oligopoly – in control of these leading products, able to widen profit-margins due to a lack of competition.

The state's role in creating and maintaining these core processes cannot be overstated as state interference is essential in the creation and enforcement of quasi-monopolies in the form of IP (i.e., patents). This is not a one-sided deal as core processes are, from a capitalistic logic, inherently in the interest of core states. Core manufacturers are on the receiving end of surplus-value flows in the world-economy, meaning that 'strong' states acquire a bigger tax base to finance their operations. The 'core' – governments and companies – thus contains an internal symbiosis where interests for accumulation are in alignment, enabling cooperation that perpetuates unequal exchanges at the cost of peripheral actors.

3.3.4. **Generic vaccines as peripheral products**

Wallerstein defines products in degrees of monopolization, and if patented vaccines are found on one end of the profitability spectrum, then generic vaccines can be found on the other end. Generic vaccines (as any other medicine) are by definition not protected by a patent and are often manufactured (i) when patents held by originators expire or (ii) during the period of protection

due to either voluntary or compulsory licensing which entitles the patent holder to “adequate remuneration”. Since generics are unprotected, they are by definition non-monopolies thereby being highly competitive since no legal barrier prevents other actors from entering the market and lowering prices for consumers.

This is however a more correct description for example (i) than for (ii) since the latter only grants permission to sole and separate manufacturers, limiting the amounts of actors involved in production and the possible competition involved. States can of course grant licenses to several manufacturers but the transaction costs of doing so would increase for every manufacturer, which would presumably stop states from exploring all possible options.

3.3.5. **Pharmaceutical patents as anti-commons**

While most production is often subject to “the tragedy of the commons” where resources held in common are over-exploited, pharmaceutical patents arguably lead to the opposite “tragedy of the anti-commons” where resources held in private are *under-exploited* leading to less treatment of patients and increased sickness of the public.

3.3.6. **Pharmaceutical industry as leading industry**

Core products are defined by their profitability made possible by state sponsored quasi-monopolies. If profitable enough such products can create and sustain entire industries through which substantial capital accumulation can occur during the period that such products and industries benefit from and retain their *leading* status. Pharmaceuticals and their developers have not always been granted such quasi-monopolies since products such as food and medicine were not perceived to benefit from IP laws. This changed with the establishment of TRIPS which effectively turned pharmaceuticals into core products on the global arena by requiring that WTO members grant 20-year patents in all technological fields, and core processes are observable in various trends of the industry. The pharmaceutical industry has grown remarkably in the past two decades – from 390\$ billion in 2001 to 1.27\$ trillion in 2020 (Mikulic 2021) – while becoming increasingly financialized: shareholder payouts have increased significantly both nominally (near 400% from 2000 to 2018) and in relation to R&D investments (88% to 123%), fixed capital investments have decreased in relation to net sales (6% to 5%) while debt and consolidation are increasingly used to minimize competition and maintain high market prices (Fernandez-Klinge 2020).

3.4. Material

In order to analyze the chosen case, different texts will be used to establish an empirical base upon which the theoretical framework can be used for interpretation and analysis. These texts will be research papers, reports, and news articles and will generally be secondary sources due to constraints in time and resources. Since the chosen case is currently ongoing, an important factor for these sources is the degree to which they are up to date, which is prioritized during the collection of material and data. New developments are inevitable which might weaken the analysis of this paper. However, more general trends or structural processes are less affected by such contemporary changes.

Due to this research paper being exploratory and qualitative in nature at least some or most of the material collected and used will originate from other disciplines (mainly medical studies), seeing as there is a relatively small body of knowledge produced by IR pertaining to global health.

Empirical data on vaccine production, procurement and distribution can be found in several of the sources this text uses of which the primary source is the *Launch & Scale Speedometer* which is an initiative led by the Duke Global Health Innovation Center (2021a). We primarily rely on this source due to its high-quality and relevant data which is arguably the most up to date among the different sources found during the material collection process.

3.5. Delimitation

For the purposes of clarity and analytical depth a level of analysis must be chosen. In this case where WST is utilized as this research paper's theoretical framework, the level of analysis will be the international system. This system is understood to have fundamental characteristics that affect and shape states, the system's basic political unit, with preferences created from system pressures; thus, creating predictability in state behavior. This prioritization of the system-level is best suited when making use of Wallerstein's theory which itself is delimited to analyzing the international system. Shortcomings are inevitable with such a narrowing of analysis such as not considering the potential differences between states, but the advantages of analytical depth and novel contributions are of academic value and arguably outweigh any disadvantage.

WST describes global linkages that involve all manner of economic activity, but for the purpose of researching a single case, the Covid-19 pandemic, the analysis will limit itself to processes and structures related to the production, acquisition, and distribution of vaccines against SARS-CoV-2. At the level of the system, this implies the exclusion of processes at the individual and national level such as the actions of officials and corporate executives, or constitutional

limitations in states and tendencies in institutions due to organizational structures. This however is weighed against the advantage of reaching conclusions and findings that are more well suited regarding general application for understanding international processes.

4. Analysis and results

We now turn to discuss four different aspects that hinder an equitable distribution of Covid-19 vaccines.

4.1. Geography of vaccines

4.1.1. Vaccine production

The production of vaccines against Covid-19 has seen a rapid development process, which have resulted in optimistic projections of how many doses of vaccines can be produced during 2021. There is a plethora of different vaccine manufacturers that are under clinical and preclinical development as this paper is being written, however only a handful have been authorized by WHO or other regulatory authorities (Wouters et al. 2021). The current estimate on the number of Covid-19 vaccines that will have been produced at the end of 2021 is currently 12 billion doses (Duke Global Health Innovation Centre 2021b). Note that is a very optimistic estimation, and due to uneven spread of manufacturers around the globe, this goal might be hard to meet. According to data collected and presented by the Launch & Scale Speedometer, the production and supply for Covid-19 vaccines during 2021 will be mainly dominated by five manufacturers, namely: Oxford-AstraZeneca, Pfizer-BioNTech, Moderna, Novavax and Janssen (J&J).

To ensure global access to vaccines against Covid-19, production and manufacturing play a very important part. However, since the production right now is understood to be limited only to the lead developers of the vaccines, equitable access proves to be a difficult task. Through WST, the relationship between which countries are able to produce vaccines and which are not, can be explained by the dimensions of a core-periphery relationship. In Table 2, the geography of the vaccine production for the five leading manufacturers in 2021 mentioned above is presented. Evidently, nations categorized into the core are dominating the landscape of production and development of Covid-19 vaccines.

Table 2. Geography of Covid-19 vaccine production.

Vaccine type	Manufacturing countries	Doses projected 2021
Oxford–AstraZeneca	United States, United Kingdom, Mexico, Brazil, Argentina, Spain, Italy, Germany, Belgium, the Netherlands, Australia, Russia, China, Japan, South Korea, India, Thailand	3000 Million
Pfizer–BioNTech	United States, United Kingdom, France, Belgium, Austria, Germany, Switzerland, China	2500 Million
Moderna	United States, Spain, France, Switzerland	1500 Million
Novavax	United States, United Kingdom, Canada, Sweden, Spain, Germany, Czech Republic, Denmark, India, Japan, South Korea	1250 Million
Janssen (J&J)	United States, South Africa, Spain, Germany, the Netherlands, Italy	1250 Million

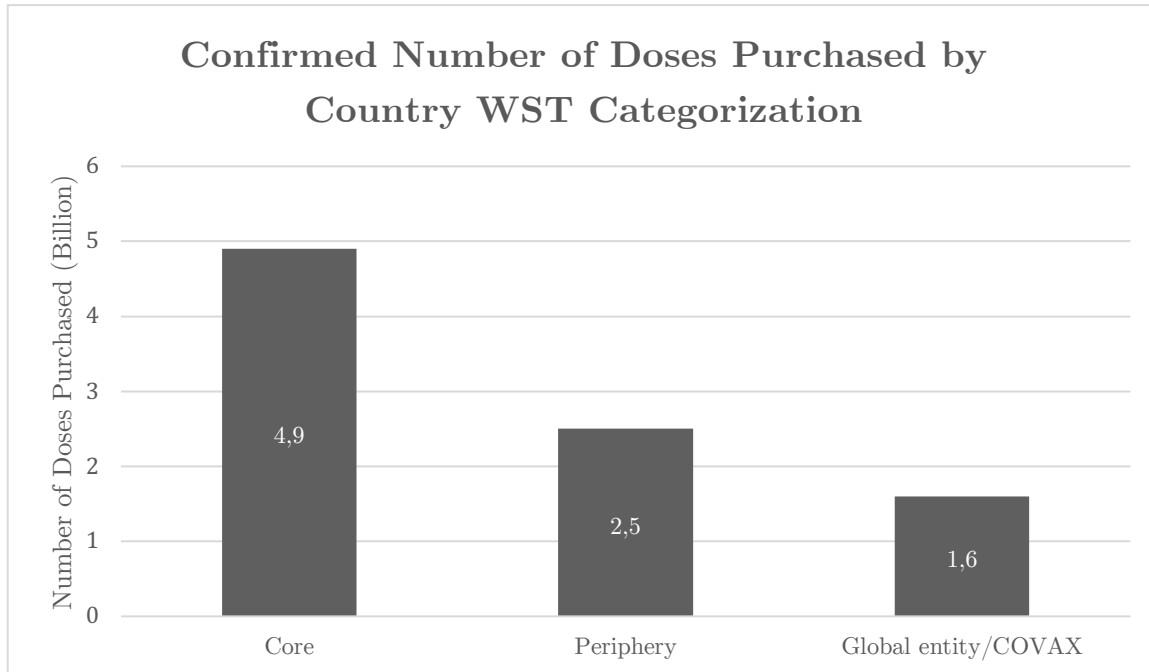
Source: Based on data from Duke Global Health Innovation Center (2021a).

Furthermore, this data supports Wallerstein’s categorizations, as this can be seen as a result of the capitalist modern world-economy that enables the continuation of a world-system divided between a core and periphery. The historically built-up dominance and advantage core states have, ultimately allows them to have better resources to develop and manufacture Covid-19 vaccines. The common denominator for a country to be able to combat a health crisis is to have resources, power, and money, something states categorized in the core have been able to accumulate and control over time. This sheds light on vaccine production as a core process. Further, as the world capacity for vaccine production already is concentrated in a few geographical areas, other factors also have to be considered when analyzing the difficulties for equitable vaccine distribution and production, such as nationalism and patents, which will be further discussed later in the paper.

4.1.2. Vaccine acquirement

The current demand for Covid-19 vaccines exceeds manufacturing capacity to produce enough doses for the whole world. Every country must rely on the production estimates and delivery schedules, to roughly know when they will receive vaccine supplies (Duke Global Health Innovation Centre 2021b). Since the estimated year for a world-wide coverage of Covid-19 vaccine is not until 2023 or 2024, the importance of equitable distribution is of high concern (Duke Global Health Innovation Centre 2021b). Figure 1 shows aggregated data from the Launch & Scale Speedometer, where the geography of vaccine acquisition is divided between purchases by countries in the core and periphery, as well as purchases by global entities (mostly constituted by COVAX).

Figure 1.



Source: Data retrieved May 15th, 2021 from Duke Global Health Innovation Center (2021c).

As illustrated above, most of the vaccine purchases fall on the high-income countries in the core. Naturally, the world-system economy allows these states to have strong purchasing power, which thus enables core states to utilize their strength and protect their quasi-monopoly and position in the world-system.

4.2. Interpreting vaccine nationalism

The nationalistic pattern of vaccine acquisition through bilateral agreements can be regarded as ‘irrational’ in several regards: higher vaccine prices, increased mortality, depressed global economy, viral mutations et cetera. Still, despite the negative net utility of health inequity, nationalistic tendencies seem inevitable in not only this but previous global health crises.

WST can explain this by first recognizing the importance of nationalism for the modern state: the *nation-state* is described as an ideal asymptote since a unifying, homogeneous identity enables effective control over territories and production processes. Maintaining and promoting the state-nation identity is thus a prioritized task, leading to the promotion of state-nation interests and utility, such as protection against viral threats through inoculation. Consequently, other interests are marginalized; domestic vaccination takes priority over international and global vaccination. An extreme example of state-nation prioritization might be Israel whose acclaimed program has given a first vaccine dose to around 50% of its own population in contrast to 0.8% of Palestinian territory populations, despite international law confirming Israel’s responsibilities (Kennes 2021; Lynk–Mofokeng 2021). The United States and EU also display nationalistic tendencies: only after American and European needs are met will international and global interests be pursued (Stolberg–Crowley 2021; Wheaton–Deutsch 2021).

Interstate strength may also prove informative as the strongest states are able to promote self-interests without retaliation, in this case through vaccine hoarding. Weaker states instead wish to improve their international standing, in this case through vaccine diplomacy. Peripheral states with production capacity (China, Russia, India) have done exactly this: donating, exchanging, or selling medical supplies to countries in need to strengthen political ties and gain soft power (Jennings 2021).

Vaccine hoarding may also be interpreted as core state attempts to hastily resume economic activity and return to “business as usual” since decreased internal consumption in growth dependent economies can lead to disproportionate downturns through negative feedback loops and start economic recessions or depressions (e.g., firms with depressed revenues are unable to service debts or must fire employees). This resumption would extend to core processes, though these would grant limited surplus inflows when peripheral states cannot fully restart their own economies due to vaccine inequity.

4.3. The role of intellectual property

4.3.1. Patents or Generics; Profit or Access

WST differentiates between products by their profitability, created by state sponsored quasi-monopolies. Capital accumulation through core products thus occurs only by limiting competition and the amounts of actors involved in the manufacturing of products. In some instances, this might be desirable to limit consumption of certain products or to protect certain industries or firms from being pushed out of the market, but in the case of the health market the opposite is almost always true. Often the “tragedy of the commons” is invoked in discussions of patterns of production: profit-seeking leads to unsustainable extraction and exploitation of common resources: *overproduction* and *excessive consumption* leads to socially undesirable outcomes. Pharmaceuticals however suffer from the “tragedy of the anti-commons” where resources held privately causes *underproduction* and *insufficient consumption*, leading to worsened health and increased mortality of the public. Core processes in pharmaceutical production are thus *inherently incompatible* with the collective social interests of states through the lens of WST, since artificial scarcity and low competition caused by state sponsorship is an essential part of the monopolization of production.

One ought to also consider that health markets have some important, distinguishing characteristics. Certain diseases or illnesses often require specific medications or treatments that have no suitable replacement, and consumers lack the choice to simply forego consumption of pharmaceuticals when faced with debilitating or fatal health issues; thus, pharmaceutical firms find themselves in extraordinary positions to create wide profit margins when able to do so.

4.3.2. IP rights, uncertainty and obstruction

The tendencies described and defined in WST can be observed in the Covid-19 pandemic as firms have repeatedly shown an unwillingness to promote greater access and increase total production when it deprives them of anti-competitive advantages.

Patents have prevented development of cheap and accessible vaccine alternatives before. In 2017 Pfizer was granted a patent in both South Korea and India for a pneumonia vaccine (which was rejected in Europe and China), preventing competition from reversing a negative accessibility trend which made child vaccination 68 times more expensive since 2001 (MSF 2020; MSF 2018; MSF 2017). Vaccine patenting has also been found to increase uncertainty among manufacturers concerning what might constitute a patent infringement, meaning that even unprotected innovations might not be pursued by non-patent holders for fear of legal repercussions

(Chandrasekharan et al. 2015). Moderna declared their patents would not be reinforced “while the pandemic continues” (Moderna 2020), but such statements are effectively meaningless since (i) they are insufficient to eliminate legal uncertainty and (ii) do nothing to assist the difficult reverse-engineering of complex and novel technologies such as mRNA. Thus, the absence of disputes, though they have occurred (Hammond 2020a-c), need not imply the incapacity or unwillingness of non-patent holders to enter the Covid-19 vaccine market. In fact, this is an expected outcome of IP rights since legal concerns will stop manufacturers from making any attempts to begin with.

Still, several manufacturers have expressed interest in producing potentially hundreds of millions of vaccines for patent holders, but this interest has been left unreciprocated (Lerner–Fang 2021; Gordon 2021; Rowland et al. 2021).

4.3.3. Innovation and the TRIPS waiver

IP rights are frequently touted as necessities for innovation and effectivization of production, not least by WTO or representatives of the pharmaceutical industry (WTO n.d.; IFPMA 2020). WST argues instead that IP is primarily and essentially a mechanism for the promotion of quasi-monopolies, creation of oligopolies and accumulation of capital. In this respect the effect of IP confirms the assertions of WST since pharmaceutical patents repeatedly increase market prices and hinders entry and participation of possible market competitors; thus, worsening access to treatment and limiting production capacity.

Innovation is thus not necessarily acknowledged by WST as described, but the neoliberal assertions are contradicted by the Covid-19 pandemic since several manufacturers rely heavily on technologies developed by public entities. AstraZeneca signed an exclusive license with Oxford University, initially supposed to be non-exclusive and available to any manufacturer willing to make low-cost vaccines (Hancock 2020). Moderna and the National Institute of Health (NIH) have collaborated in creating the mRNA-1273 vaccine, Pfizer and J&J have used protein spike designs made by NIH researchers, mRNA technology was first developed in the University of Pennsylvania and the essential lipid nanoparticle used in mRNA vaccines originated in the Massachusetts Institute of Technology (Allen 2020). In addition to the huge amounts of public investments made through APAs and non-profit funding these are all examples of production costs not internalized by private firms, delegitimizing claims that private firms require profits for risk-taking and IP rights for innovation.

The TRIPS waiver proposed by South Africa and India to WTO has been criticized with such arguments in addition to assertions that supply-chain bottlenecks and production ‘know-how’ are more important for global production capacity than patents (IFPMA 2021). Yet, bottlenecks are often caused by quasi-monopolies such as those on lipid nanoparticles, the most

expensive and scarce ingredients for mRNA vaccines, which are protected by patents held by a small number of companies (Irwin 2021a). ‘Know-how’ is also important since in addition to necessary equipment, facilities require personnel capable of using this equipment correctly and effectively. WHO understood this and thus established Covid Technology Access Pool (C-TAP) for firms to share such helpful data and knowledge, nevertheless it has received zero contributions since no firm wishes to cede market advantages voluntarily, even to increase global production capacity (Safi 2021), implying that compulsion is required for knowledge sharing.

4.4. Current and future global health governance

4.4.1. COVAX: progress, familiar flaws, and fundamental issues

Vaccine development is a costly, complex, and risky venture as most attempts fail at some stage: by February 2021 there were 289 vaccines in development, 66 were in clinical trials and only 5 were approved by stringent authorities (Wouters et al. 2021). An example of investment risks is the Sanofi/GSK vaccine which has received the most public funding of any candidate (2.1\$ billion) but has yet to complete development (Sagonowsky 2021). Any actor wishing to fund vaccine development would thus want a diversified vaccine portfolio to increase rates of successful investments in addition to diversifying vaccine properties which vary in demographic suitability (Jackson 2020). States investing bilaterally in individual candidates thus expose themselves to higher risks in comparison to the alternative of collective schemes which can acquire a more diversified portfolio and where risks are shared amongst participants.

COVAX makes such derisking possible for participating countries and lowers prices substantially through collective purchasing power, an important aspect due to the vast volumes required but also serves as a vital lifeline for lower income states unable to procure their own vaccines (Berkley 2020). The initiative, with 190 state members and having raised 14.6\$ billion, is an unprecedented achievement in global health governance (Nature Editorial 2021; WHO 2021). Nevertheless, COVAX still remains underfunded with an 18.5\$ billion gap at the time of writing (WHO 2021), faces direct competition for doses from mostly HICs adhering to nationalistic strategies, and will only vaccinate 20% of peripheral states’ populations, a goal unlikely to be reached and still insufficient to solve vaccination inequity (Wouters et al. 2021). Furthermore, COVAX gets criticized for not addressing a more fundamental issue: empowering states to produce their own supply (Ravelo 2021).

WST addresses the cause of peripheral impoverishment: surplus-value flows out of peripheral states through unequal exchanges. This has historically led to peripheral states being

unable to accumulate capital, create sufficient tax bases and strengthen the state structure. Thus, the periphery has historically been rendered unable to establish and improve their productive processes, meaning that certain industries are effectively absent in the periphery, e.g., there are only 10 African vaccine manufacturers and 99% of vaccines used on the continent have been imported for decades (WHO Africa 2021; Irwin 2021b).

One such production process has been production of knowledge through research. Public research has played a vital role for the development of current Covid-19 vaccines, and due to unequal exchanges peripheral states have been unable to fund public institutions able to produce knowledge. The Establishment response to 1968 has certainly played a part in this, forcing peripheral states to accept structural adjustment which cut public spending otherwise used for funding public research, and education which would have produced skilled workers (e.g., doctors, nurses) needed during health crises. Peripheral states have also been unable to invest in infrastructure improvements, creating logistical and administrative obstacles in vaccine deployment such as identifying eligible individuals, contacting and recalling patients, transportation, cold-chain storage et cetera (Wouters et al. 2021). Long-term solutions would thus require addressing peripheral capacity, not just solving symptoms such as supply scarcity caused by the stifling of peripheral and in turn global production.

4.4.2. **A world-system in crisis: opportunities for global health**

Wallerstein argues the capitalist world-economy is undergoing a systemic crisis due to rising costs of production and the disillusionment with antisystemic forces following the cultural shock of 1968. Recent trends and events appear to support this assertion.

This pandemic is no anomaly, instead it is expected and inherent to the pursuit of endless profits which requires extractive and cost-minimizing practices that cause anthropogenic changes and ecological disruption, thereby increasing the risk of pandemics (IPBES 2020). The Establishment attempt to restore systemic order with the Washington consensus and neoliberalism has continuously failed to address such existential threats (e.g., global warming, ecological breakdown, pandemics), in fact these threats have been worsened due to capital accumulation being insensitive to social and ecological changes. Since the current world-system is not only unable to solve these existential issues but is arguable both cause and catalyst, a new world-system characterized by new values and forces inevitably must replace it.

Today the capitalist world-economy prioritizes profit, promoting and rewarding profit-seeking behavior and actors engaging in such conduct. However, while perpetual capital accumulation has persisted for centuries, other more socially conscious values have risen to prominence through antisystemic movements. Universal human rights are recognized today as a

fundamental principle; the Doha Declaration (WTO 2001), WHO Constitution (WHO 2020) and Universal Declaration of Human Rights (UN 1948) serve as examples and confirmations of this. Disillusionment with antisystemic forces does not imply abandonment of such values, instead the pursuit of them is no longer perceived to be feasible within a world-system inherently in conflict with such values.

A new world-system that abandons the endless pursuit of profit might then retain the acknowledgment of universal human rights and establish a new pharmaceutical regime which disavows profits of firms, core industry monopolies or inequitable promotion of state-nation interests; instead promoting access to medicines for all.

5. Conclusion

The purpose of this paper was to explore and answer the research question: “In a global context, how can inequitable access to medical resources be understood and problematized through World-Systems Theory?”. By analyzing the Covid-19 pandemic, this study has found that the way the world is systematically structured has a decisive and arguably detrimental impact on how vaccines are manufactured, purchased, and procured during a global health crisis.

In summary, empirical data shows that the geographical distribution of development, production and distribution of Covid-19 vaccines is heavily concentrated in core states and can thus be understood as core processes heavily reliant on state intervention. The inequitable distribution of vaccines caused by vaccine nationalism can be interpreted as a consequence of modern nation-states promoting their self-interest, the conception of which is affected by state-nation identities constructed for effective territorial control of production processes. Anti-competitive mechanisms and tendencies such as patents or know-how secrecy are expected in the capitalist world-economy and are observed in the Covid-19 pandemic, in addition to the resulting insufficiency of global vaccine production. COVAX, while being a significant and unprecedented achievement, does not solve fundamental issues caused by the world-system’s core-periphery division. Lastly, the systemic crisis described by Wallerstein is arguably exacerbated by this global health crisis since the incompatibility of endless capital accumulation and the collective social interest is demonstrated by capitalist markets’ inability to produce vaccines accessible to all.

Further research could serve to elaborate on these findings. As this paper intended to apply WST on IR and global health, emphasis has been placed on the interplay between several aspects of this novel area of inquiry. Thus, future studies can choose to analyze fewer or individual aspects of this research area for narrower research with greater depth of these aspects. Quantitative studies could serve to confirm or refute propositions made in this study, such as the relationship between state-nation identities and international collaboration. The relationship between state strength and the tendency to impose unequal trade rules (i.e., TRIPS-plus) might also be explored. Post-pandemic studies can assess the achievements of COVAX and the future of global IP rules and the pharmaceutical regime. Lastly, narrower case studies can analyze more precisely the actions of various states during the Covid-19 pandemic.

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