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Covid-19 vaccines: Is the trips waiver an effective solution to the lack of vaccines in developing countries?

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Abstract
This paper seeks to analyze the proposal of a TRIPS Agreement waiver regarding the COVID-19 vaccines. In October 2020, India and South Africa proposed a waiver of the TRIPS Agreement arguing that it would make the vaccines more accessible to developing countries. Since then, a discussion related to the effectiveness of this measure was raised and different positions on that matter were taken. In light of this, firstly, this article provides an insight of the importance of intellectual property rights in the pharmaceutical industry. Secondly, it presents the reasons why the waiver of intellectual property rights would not be sufficient to deal with the current situation. And finally, other measures that can be taken to deal with the COVID-19 pandemic in a much more effective way are presented.

Keywords: intellectual property rights, COVID-19 vaccines, trips agreement waiver

Introduction

Intellectual property is a type of property that derives from creations of the human mind. To protect these creations, the government confers a legal protection to creators so they can obtain benefits as a result of their intellectual effort and through that, stimulate new works and developments in society. There are different types of intellectual property protection and the four most known types are: patents, trademarks, copyrights and designs. Each one of them covers a distinct aspect of inventions and different parts of one single invention can be protected by a different type of intellectual property right.

The World Trade Organization (hereinafter WTO) is a global international organization that deals with the global rules of trade. This organization play an important role in intellectual property since it establishes treaties that deal with intellectual property rights matters, such as The Trade-Related Aspects of Intellectual Property Rights (hereinafter TRIPS Agreement).

The TRIPS Agreement is a WTO multilateral agreement that promotes effective protection of intellectual property rights and ensures that measures to enforce them do not become barriers to legitimate trade. This Agreement brought important changes to the intellectual property rights field.

When the TRIPS Agreement was approved, critics argued that the Agreement provided unnecessarily strong protection of intellectual property rights, and that prevented developing nations from having access to affordable crucial medications. As patents enable pharmaceutical manufacturers to charge higher prices to recover the expenses of research and development and make profit, the implications of patents being a barrier for access to medicines by the poor, have brought the relationship between the TRIPS Agreement and health to the forefront [1].

The issues raised about the consequences of the TRIPS Agreement on public health were reflected in the adoption of the Doha Declaration on the TRIPS Agreement and Public Health in 2001. While recognizing the role of intellectual property protection for the development of new medicines, the Declaration specifically addresses concerns about resulting effects on prices, and states that the Agreement does not and should not prevent members from taking measures to protect public health [2].

During the COVID-19 pandemic, the confrontation between the TRIPS Agreement and public health was raised again, and a discussion about the possibility of a TRIPS waiver emerged. As the vaccines for COVID-19 started to be produced and distributed, a big discrepancy between wealthy and low-income countries arose.

This matter was raised because vaccination against COVID-19 is a public matter that involves the whole world, but developed countries had much more access to the vaccines than many developing countries. If only some countries get their population fully vaccinated, the pandemic will not end and the world situation will not improve. So, one of the proposals to solve this issue was the lift of intellectual property rights of the COVID-19 vaccines to dramatically increase the number of producers. However, many matters of how that could be put in practice were raised.

Thus, this paper aims to analyze the relevance of a waiver of the vaccines' intellectual property rights and how that would impact on the problem of vaccination in developing countries. It also explores the consequences that a waiver of the TRIPS Agreement would have on the pharmaceutical industry and if that could affect future innovations in that field. Besides that, it also considers how other factors, such as regulatory issues, lack of raw materials, issues to transfer know-how, and protection of intellectual property rights by bilateral agreements impact on the distribution of vaccines to developing countries.

So, the present article focuses on the intellectual property rights that protects the creation of vaccines, the possibility of a waiver of these rights and the consequences that this measure would have. Also, other options that may be more effective to solve the present discrepancy are discussed.

Patents, Trade Secrets and the Pharmaceutical Industry

A patent is an intellectual property right granted by the government to an inventor for a limited period of time and during this time the patented invention cannot be commercially exploited, in the country where the patent was conferred, without the owner's authorization. Further than that, the owner of the patent has the right to take action against anyone exploiting the invention, and to sell or license it to others. Different kinds of technological inventions can be protected through patents, it can be either processes or products, as long as it meets the patentability requirements.

In order to obtain a patent some requirements must be fulfilled. Three requirements are established in Article 27 of the TRIPS Agreement, these are: novelty, an inventive step, and industrial applicability (Art. 27.1 TRIPS). As the TRIPS Agreement does not define the patentability requirements, it leaves some flexibility margin for interpretation. However, the World Intellectual Property Organization (hereinafter WIPO) determines its general meaning. In the WIPO Intellectual Property Handbook [3], which is a general reference work on all aspects of intellectual property, the requirements are defined as it follows:

The novelty criterion establishes that the invention must have a new feature that is not anticipated by the prior art, that is a feature which is not known in the body of the existing knowledge prior to the relevant filing or priority date of a patent application. The second criterion that must be met is that the creation must involve an inventive step, meaning that it must represent a significant and essential advance. This is also called as non-obvious step, which means that the invention must not be obvious to a person having ordinary skill in the art. At last, the third criterion established in Art. 27.1 of the TRIPS Agreement requires that the invention must be industrially applicable, so it must be useful for an industrial or business purpose, going beyond mere theories. To analyze this criterion, the term "industrial" should be considered in the broadest way, including any kind of industry. There is an additional requirement established by the TRIPS Agreement, which stipulates that the invention shall be disclosed in the application in a sufficiently clear and complete manner, so it can be carried out by a person skilled in the art (Art. 29.1 TRIPS). The main goal of this criterion is to spread new technological knowledge to the public, so the patent holder obtains the right to decide who can and who cannot use its patent and in exchange it has to disclose the invention to the public.

If a technological invention fulfills all the criteria above, it can be patented. One of the many subjects that can be patented are medicines and related inventions, such as vaccines. One of the goals of the patenting system is to promote innovation by giving rights to the holder of a patent, when it comes to the pharmaceutical industry this protection plays an important role. Since the patent provides the owner a legal monopoly, it enables them to stop the competitors and profit from their inventions [4].

To develop new drugs, the pharmaceutical industry needs a lot of investments, time, and complex processes that involve risks. For that reason, it is essential to ensure a return on investment for companies and researchers so it can encourage the creation of new medicine, because without it, innovators would probably not make the investments needed to develop new medicines and that would harm the advancement of healthcare [5].

As a matter of fact, Edwin Mansfield [6] shows that the lack of patent protection would have a small impact on the innovation attempts of most industries, however, the pharmaceutical industry was an obvious exception. As stated by the author, this is due to the high level of investments that are necessary to develop new drugs, and the high costs of imitation, meaning that without patent protection, different laboratories could prepare the medicine and profit from it, which would lead to big losses to the creator of the drug.

As previously mentioned, one of the requirements to be the holder of a patent, is that the innovation must be sufficiently disclosed in the application file, so the knowledge revealed can facilitate the production of other products or processes, and to clarify the contours of a patentee's property interests. However, in most cases these goals are not achieved since the patent's system fails in providing the minimally effective information to explain how protected technologies operate [7].

Even though most of the industries fail in providing the specific details of its innovations, the pharmaceutical industry often provides enough information about their products and processes in the disclosure of a patent. However, this alone may not be effective to reproduce the products or processes, because many of these innovations also involve trade secrets that are confidential, i.e., that are not disclosed to the public.

A trade secret is an information which is not generally known among or readily accessible to persons within the circles that usually deal with the kind of information in question, has commercial value, and has been subject to reasonable steps by the person lawfully in control of the information to keep it a secret (Art. 39 TRIPS). Trade secrets are different from patents [8], its scope is broader, it may consist in different kinds of information, such as strategies, formulas, and its main benefit is that no disclosure or registration is required, so the companies can keep valuable business information as a secret.

Often, the same information can be protected by patents or trade secrets. If the intellectual technical assets of a company were to be compared to an iceberg, patents would be the visible part and trade secrets the submerged part [9]. In that sense, trade secrets can be used in combination with other intellectual property protection mechanisms to protect complex innovations [10], including mixed with patent protection.

These two types of protection serve two different purposes, while patent law mainly serves to promote the spread of information, trade secret law mainly serves to protect some information of economic value from theft and prevent misappropriation of a party's trade secrets [11]. In a creation, some parts can be protected by patent law, and other parts by trade secret law.

As some commentators recognize, patents and trade secrets can both be used to protect an invention as long as they do not protect the exact same thing [12]. In that sense, an innovation that does not fulfill the patentability requirements can be a trade secret. Or, if there is a need to disclose the innovation to the public, then the innovation cannot be protected by trade secrecy law.

Disclosure of a trade secret, including in a patent, destroys its value [13]. In the pharmaceutical industry trade secrets play a key role, as it encompasses manufacturing know-

how, test data, biologic resources, negative information, and more [14]. Therefore, pharmaceutical companies hold this kind of information in secrecy for its business value, and the obtainment of this kind of information by a competitor can be a big disadvantage.

When it comes to the protection of vaccines, detailed information on vaccine production processes is generally not patented. Instead, this information is protected by trade secret law, under which is never disclosed to the public, differently from patent protection, since there is no expiration term [15]. Thus, patent protection is not the only barrier to the replication of vaccines by competitors, obstacles such as trade-secret-protected information also exist. For example, a vaccine might be patented, but its manufacturing process may be protected by trade secret.

In that sense, just by reading a patent does not necessarily offer the ability to replicate the product or the process, it is also necessary to have access to the exact manufacturing process, the know-how, so the product and process can be properly done. However, pharmaceutical companies are unlikely to turn in valuable trade secrets willingly, so a question remains unresolved: in critical situations, can they be forced to disclose trade secrets?

With the advance of the COVID-19 pandemic, matters related to the intellectual property rights protection of the COVID-19 vaccines were brought to attention, and a discussion about the possibility of a TRIPS waiver began. The discussion started due to the discrepancy of the access to the vaccines between developed and developing countries, and some countries stated that the waiver would be the proper solution for this matter. However, before taking that unprecedented measure related to vaccines, some legal and factual problems must be faced.

Covid-19 Vaccines: Are the Intellectual Property Rights the Only Barrier to Access It?

The COVID-19 pandemic had a big impact in all aspects of daily life. Public health, economy, employment, and many other fields were heavily affected by the pandemic. With that, the need for a vaccine became urgent, so the pharmaceutical industry began to research and produce vaccines in a speed that has never been seen before. Fortunately, vaccines were produced and doses started to be applied in 2020, however, the distribution of these vaccines were not proportional. Developed countries, such as the United States of America, had much more access to the vaccines than developing countries, such as Niger. For that reason, the issue of how this discrepancy could be solved arose, and a proposal for a waiver of the vaccines' intellectual property rights started being discussed.

In October 2020, both India and South Africa proposed, at the WTO's Council, the waiver of some provisions of the TRIPS Agreement during the pandemic so the technology needed to produce vaccines and medicines could be more accessible [16]. This request began a discussion about the possibility of a waiver and if that would be an effective decision to increase the vaccination numbers in developing countries.

Supporters of the TRIPS Agreement waiver argument that it will accelerate global vaccination because the vaccines will be more affordable if there are no intellectual property rights preventing the countries to produce it. Throughout the world different opinions related to this matter appeared, some countries and organizations backed up the idea of the TRIPS waiver, while other countries and the pharmaceutical industry did not agree with the proposal.

The UNESCO [17] described the COVID-19 vaccine as a global public good, meaning that the COVID-19 vaccines must be equitably available in all countries and not only to those who can pay more for them. This notion comes with the understanding that this issue must be seen in a broader way, to reboot global economy the pandemic must be controlled everywhere, not only in developed countries. To do that, the vaccines must be distributed to developing countries so the pandemic can come to an end in a faster way.

Even though the idea of a global vaccination against COVID-19 is widely spread, different approaches to achieve this goal can be taken, including the TRIPS Agreement waiver. At first, when India and South Africa proposed the waiver, countries such as United States of America and France were against it. However, on May 2021 the U.S. government changed its prior position and started to support the TRIPS waiver for COVID-19 vaccines. This change of position was a political and economic shock throughout the world and made governments from other countries rethink their position against the waiver.

The European Union started as an opposer of the TRIPS Agreement waiver, but indicated its willingness to talk about the possibility of a waiver after the U.S. decided to be in favor of it. Nonetheless, some countries, such as Germany, still rejects this measure and holds to the position that the main issue related to the imbalance of vaccines distribution is not related to intellectual property rights. The German government stated that the main reasons of this inequality are capacity and quality standards, and lifting intellectual property rights would not solve the real problem and that measure could be harmful to the future of innovation [18].

The pharmaceutical industry also rejects the possibility of a TRIPS waiver. Big Pharma has stated that all available manufacturing capacity is being used and the waiver of intellectual property rights will not deal with the real challenges to getting more people vaccinated. They state that this decision will not solve issues regarding distribution and limited availability of raw materials needed to manufacture the vaccines.

Further than that, if the companies have to share their know-how with others, so they can produce the vaccines, this would become a major concern because there is not a practical way in which the companies could revoke the know-how transferred. For example, BioN Tech has been a pioneer of mRNA (Messenger Ribonucleic Acid) treatments and before COVID-19 was mainly focused on cancer treatments. If this know-how is forcibly acquired by third parties, it would radically compromise intellectual property rights and reduce the probability of investments in other technologies that could help in the future [19].

Despite of the economic and political aspects of some countries deciding to support the TRIPS waiver, the ultimate decision relies on the WTO. The TRIPS Agreement allows rules to be waived in exceptional circumstances (Art. 31 TRIPS Agreement) if the 164 members of the WTO agrees to it.

However, even if a TRIPS waiver is approved in the WTO, issues related to its effective implementation would remain. Each WTO Member State has its own national law that protect intellectual property rights, so each State would have

to decide how they would change their domestic laws to apply the TRIPS waiver and those procedures could differ a lot from country to country, creating an inconsistency in the application of the measure. Other matters would also arise, such as limited availability of raw materials to produce the vaccines and if this measure would be effective to deliver vaccines to developing countries in a faster way or if would just be a symbolic act with no actual response to the main issue.

Also, vaccines are not made under a single patent. They are made under licenses for many patents. Therefore, an Indian company wishing to produce a vaccine needs not only access to the lead patent for the vaccine but also to the many other patents under which the vaccine is produced. These "secondary" patents might be for products or methods that are used in the production of many other vaccines, pharmaceuticals, or laboratory tests. So, even if the Indian company got access to these secondary patents, there would have to be monitoring system to ensure that the Indian company did not use the patented products for purposes unrelated to the vaccine. Thus, to work out all the licensing and monitoring systems that will be needed, it would take a long time, and many possibilities of breaches could happen.

Besides all of that, the TRIPS Agreement is not the only basis for international property rights protection. Bilateral investment treaties also play an important role in the protection of these rights and many issues can come from that. Pharmaceutical companies that have developed COVID-19 vaccines might have a claim under international investment agreements against States that waive intellectual property rights on COVID-19 vaccines [20].

Over the years, a substantial number of bilateral investment agreements in the field of intellectual property rights were concluded between states. The protection sought under these agreements exceed those required by the TRIPS Agreement, which establishes the minimum standards of protection for intellectual property rights [21]. Through these agreements, the investors who use intellectual property as a form of investment are protected, and it gives the possibility for an intellectual property right holder to bring a claim against a state that breached a bilateral investment treaty [22].

In the pharmaceutical industry a lot of companies figure as investors that have intellectual property rights protection under bilateral investment treaties. In case of a waiver of the TRIPS Agreement provisions, the pharmaceutical investors can still claim compensation in international tribunals since their rights are not only covered by the TRIPS Agreement. If the investors feel that their rights have been breached through the waiver of their intellectual property rights and that created an unfair treatment, arbitration disputes could arise in light of the breach of bilateral investment agreements.

For example, Pfizer, one of the companies that produces COVID-19 vaccines, has their intellectual property rights protected by bilateral investment treaties in 160 countries, so a TRIPS waiver would not be enough to guarantee access to the vaccines without further problems. Through that, the countries that take advantage of the waiver could be putting themselves at risk of years of expensive legal disputes [23].

In that sense, the supporters of a TRIPS waiver argue that it will accelerate global vaccination because the vaccines will be more accessible if there are no intellectual property rights preventing other countries to produce it, and that would get more vaccine shots to developing countries.

However, concerns related to the availability of raw materials and technology to the production of the vaccines must be considered. Besides that, this measure would hand over valuable companies' information that are kept as secrets, and that would be a big disadvantage to the pharmaceutical companies. It would also need a complex system to keep track if the technologies protected are only used to the production of COVID-19 vaccines. Furthermore, there is not a provision that establishes how each country would implement an effective waiver of rights under their national law, leading to an inconsistency on the application of this measure. Another legal aspect that many supporters of the waiver do not consider, is the fact that the TRIPS Agreement is not the only agreement covering the intellectual property rights of the companies that produce vaccines, so just the waiver would not prevent future proceedings related to these rights that are also protected under bilateral investment agreements.

Thus, the issues surrounding the distribution of COVID-19 vaccines go beyond the TRIPS Agreement provisions and also beyond intellectual property rights. In light of this, is it reasonable to expect that a waiver of the TRIPS Agreement suffices the present need of distribution of vaccines in a more effective way to developing countries?

Vaccine patents waiver: an effective solution or just a symbolic act without any major results in terms of public health?

When it comes to the factual effects of the waiver, in terms of public health, many particularities must be considered. As previously mentioned, the TRIPS waiver does not encompass all the issues that are being faced by developing countries to have access to the COVID-19 vaccines. Things such as: the need of know-how transfer, availability of raw materials, effectiveness of the waiver under national laws, and protection of the intellectual property rights by bilateral investment agreements also constitute important issues that need to be considered.

Supporters of the waiver on the COVID-19 vaccines argument that a previous waiver of intellectual rights already happened before and it was a successful measure. This case of the intellectual property rights waiver happened in 2003, when the provisions of TRIPS were considered as a barrier to the importation of generic drugs used to treat HIV, malaria and tuberculosis in developing countries.

However, the situation in 2003 only involved the production of medicines and now what is needed is the production of vaccines. Medicines in pill form (such as the medicines used for HIV, malaria and tuberculosis) are easier to reproduce, the only thing needed is the recipe. When it comes to vaccines, a much more complex process is required, a recipe is not sufficient, and the developer needs to teach a manufacturer how to make them. Therefore, a comparison between the two situations does not make sense since the problem now involves much more complexities.

In this regard, when it comes to the real problems surrounding the access to the COVID-19 vaccines, it is not a matter of protecting intellectual property rights and preventing people to have access to vaccines versus waiving intellectual property rights so developing countries will instantly have more access to these vaccines. The reality is: at this stage, a TRIPS waiver would only play the role of a symbolic measure that would not actually change the reality. This measure would only play the role of promoting

goodwill. Because in reality, it would only be a precedent for weakening intellectual property rights protection and a way to challenge the pharmaceutical industry innovation model, that seeks profits in exchange of all the research and development done, which can lead to future unwillingness of pharmaceutical companies to develop vaccines in future pandemics.

In the current situation, the waiver will not actually help achieve the goal of getting more vaccine shots to developing countries. Even if the waiver gets approved, it will take months of international pushback before the proposal would take effect, besides the problems with supply chains, transfer of knowledge and trade barriers.

In light of that, as the urgency for effective measures is notorious, other strategies must be adopted to decrease the discrepancy around the world. For example, on 28th July 2021, in Canada 57.37% of the population was fully vaccinated against COVID-19 and 13.85% of people were partially vaccinated. In comparison, in the same date, in Mozambique, only 1.02% of the population was fully vaccinated and 0.17% was partially vaccinated [24]. However, it is not a waiver of intellectual property rights that will shift the present situation.

To respond to the ongoing crisis that many developing countries are facing to get vaccine shots, more effective steps can be taken, so the critical situation in these countries can be properly dealt with and the chaotic situation can be surpassed. Other plans to improve the present situation are already being put in practice and governments need to collaborate so the measures can be successful. Some of these alternative plans are:

1. The COVID-19 Vaccines Global Access Facility

Countries that have more vaccine shots need to share this surplus with mechanisms such as the COVID-19 Vaccines Global Access [25] (hereinafter COVAX), so that they are distributed to countries in need. The U.S. government, for example, is already implementing this measure, as it decided to share 80 million doses of vaccines globally, and 75% of these doses would be shared through COVAX [26]. A lot of countries, such as Brazil, already received these shots that were shared by the U.S. government, but many more doses are needed to fulfill the demand in the world.

Thus, a step that can be taken by the countries is to use COVAX to share remaining vaccine doses. COVAX is a facility created to promote vaccine equity worldwide and works by making deals with vaccine manufacturers to purchase doses from a portfolio of producers on behalf of countries that are COVAX members. With that, the goal of COVAX is to make sure that all countries can have access to vaccines despite of its ability to pay. In 2020, COVAX set a goal of buying and sharing 2 billion doses of vaccines before the end of 2021. However, many obstacles appeared and until September 2021 only 301 million of doses were shared.

COVAX is facing some issues to provide vaccine shots. The main problems surrounding it are: money, vaccine supply, and global willingness to share. To work as planned, a considerable number of rich countries had to buy into COVAX and commit to getting their doses through the fund. However, a lot of governments made separate bilateral agreements with companies locking up in contracts the vast majority of doses scheduled to be produced in 2021. That harmed COVAX because it took the opportunity to buy vaccines for poor countries through the facility, since it did not have much money at the beginning of the pandemic [27].

But the situation above can still be amended. It is important that COVAX obtains funding now, so it can acquire vaccine shots of new companies that are producing vaccines. For that, wealthy countries must also step up to provide financial support for vaccine purchases. Besides that, getting vaccine doses requires a complex global supply chain. From the ingredients needed to produce the vaccine to the syringes, it involves a lot of logistical matters and COVAX has struggled with it. Hence, there is a necessity of a global plan to increase the scale and security of vaccine production.

2. Production Agreements with laboratories

Another strategy that can be adopted is to make production agreements so that other laboratories can manufacture more shots of the vaccines already tested and approved. In practice, this is already happening with the vaccine AstraZeneca and Oxford University, for example, that was licensed to be produced by the Bio Manguinhos Institute of Fiocruz, in Brazil. The idea, then, would be to expand this technology transfer model, in that way pharmaceutical companies could teach everything step by step, allowing certified partners to learn how to manufacture vaccines in their smallest details.

3. Financial support for vaccine purchases and relief on export restrictions

Also, to accelerate the vaccination throughout the world, global vaccine production by existing producers should be expanded and shots should be offered at lower prices for low-income countries. Additionally, all countries could start renouncing export restrictions that threaten global supply chains. As provided by the WTO [28], bilateral and regional agreements could ease import and export restrictions on input supplies for key routes [29].

Wealthy countries must also step up to provide financial support for vaccine purchases and immunization programs. Political leaders in wealthy countries should clarify to their citizens that offering support to low-income countries is in their own interest. Since the pandemic is producing potentially more transmissible and deadlier variants, if a major part of the population does not get vaccinated, these variants will inevitably proliferate worldwide.

Therefore, there are other measures that can be taken to increase the numbers of vaccinated people in the world. However, to improve the existing structure, concrete steps must be taken in a global scale. This includes an agreement on the public health guidelines and metrics for vaccine distribution, donations of doses by wealthier countries that have surplus, and mechanisms to ensure that vaccine supply chains can operate smoothly.

4. Cooperative system for future pandemics

In light of this, with the chaotic scenario that the COVID-19 pandemic brought, the global community needs to prepare a cooperative system to address the chances of the present pandemic lasting a long time, while preparing for future pandemics that could happen with more frequency. Treaties on that matter can be made to provide a more effective structure to deal with urgent public health issues that may arise. For that, infrastructures must be strengthened in each country and a worldwide plan of action must be discussed

and established. Nonetheless, financing research and development in developing countries must be a central discussion when outlining this infrastructure, so a discrepancy such as the present one can be undermined in future public health matters.

To do that, cooperation of multiple sectors is needed. Despite of the fact that the scientific community operated in an unprecedent manner to address the challenges imposed by the COVID-19 pandemic, that did not compensate the lack of proper governance and international cooperation failure between countries. To prepare for future pandemics, these failures must be understood and the system must be improved.

First of all, the World Health Organization (WHO) must be empowered with the authority to promptly examine the origin of disease outbursts and manage access to new diagnostics, vaccines and medicines. A diagnostics agenda for global health is essential, since one of the major issues faced in many countries during the COVID-19 pandemic was the lack of enough tests to diagnose COVID-19. To overcome this issue, and be prepared for future pandemics, a diagnostics agenda for global health is needed and access to crucial diagnostic tools should be provided. Along with that, to put this agenda in practice it is important to develop effective diagnostic systems in countries, and provide manufacturing bases both in developed and developing countries [30].

Furthermore, regional structures must be strengthened and given the authority to declare disease outbreaks as regional threats and coordinate responses. As the global health security begins at national level, institutions specialized in research and development must be created, properly funded, and supported by organizations. It is also urgent to invest in the improvement of the public-health workforce and its response in pandemic situations, especially in developing countries [31]. Also, vaccine facilities around the world must be founded and financed, so in case of pandemics these places can be used to produce vaccines in large scales.

Thus, The COVID-19 pandemic has called attention to a critical need for investment in readiness for global outbursts of pandemics, including systemic investment in public health, diagnostics and technologies. Further than, the need for international cooperation and funding became clear. To prevent chaotic situations as the one occurred during the COVID-19 pandemic, there is an urgency to rethink the public health system, and also the international cooperation system.

Conclusion

The COVID-19 pandemic impacted the whole world and with that the pharmaceutical industry had to quickly respond to the chaotic situation. Vaccines against COVID-19 were produced in a speed that has never been seen before, so the world could get back on track. However, even though many wealthy countries are in a much better situation now, many low-income countries are still struggling a lot and are not receiving vaccine shots, which is the main solution to end the pandemic.

Despite of the fact that many countries are already recovering from the major negative impacts that the pandemic had, to reboot the economy again, the situation must be dealt in a global scale, meaning that if low-income countries do not recover as fast as possible of the humanity and economy tragedy that the pandemic brought, the world situation will also not recover. In light of this, the waiver of the TRIPS Agreement appeared and started being discussed. However, considering issues such as the availability of raw materials, transfer of know-how, implementation of the TRIPS Agreement waiver in each country, effects that a measure like that would have on the pharmaceutical industry and its response to future issues, and the long time that a waiver would take to be implemented, this waiver would not be effective to deal with the present matter. This measure would have much more a symbolic effect, instead of getting actual vaccine doses to people – which is the actual issue.

To properly address the current issue that many developing countries are facing, other actions can be taken. For that, a global cooperation is needed and the COVAX facility must be readjusted so vaccine shots can be sent to countries that need it. Wealthy countries need to contribute by sharing their surplus and also by funding, so more vaccines can be bought through COVAX and shared. The international system must learn from all the mistakes that occurred with the outburst of the COVID-19 pandemic, and prepare for future pandemics. After all, a lesson that came out of the COVID-19 pandemic is that the world needs more cooperation in order to achieve other goals and without humanity to help others the economy will also suffer.

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