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**How to Not Save the World From COVID-19:
The Dire Consequences of Giving Away the Vaccine Formula**

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Abstract

The debate over giving away the COVID-19 vaccine formula is a political hot topic. Violating intellectual property law (patents) to give away the vaccine is a tempting option for aiding other countries in the current global health crisis. In actuality, many problems exist with this proposed solution, including violating intellectual property law, disincentivizing innovation, undermining confidence in vaccine safety, harming America's geopolitical objectives, and inefficiencies. The United States can and should aid the world in obtaining vaccines, but it should not do so by waiving patent law and giving away the vaccine formulas.

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How to Not Save the World From COVID-19: The Dire Consequences of Giving Away the Vaccine Formula

In an unprecedented and devastating situation like the COVID-19 pandemic, the development of vaccines has provided hope. The challenge is how best to reach the rest of the world with the vaccines. One idea to expand vaccine availability is waiving intellectual property law (patents) and forcing pharmaceutical companies to give away the vaccine formulas. It is tempting to frame this situation as private profits of Big Pharma versus public health, but the situation is much more complex. Giving away a vaccine formula may appear to be a panacea to ending a global health crisis. In actuality, giving away a vaccine formula has many problems, including violating intellectual property rights, disincentivizing innovation, undermining confidence in vaccine safety, harming America's geopolitical objectives, and creating inefficiencies. Thus, while the United States can, and certainly should, aid the world in obtaining vaccines, it should not do so by violating intellectual property law and giving away vaccine formulas.

Intellectual Property Law

The contention surrounding giving away vaccine formulas is the violation of intellectual property law. Intellectual property laws provide incentives for innovation by securing the rights to inventions (Lindsey 2021). Without patent protection, later entrants to the market can achieve a second-mover advantage by avoiding the extensive research and development costs that original innovators suffer from (Lindsey 2021). With exclusive rights to the market, innovators have a better chance of recouping investment, especially when it comes to the high costs associated with pharmaceutical research (Lindsey 2021).

Giving firms monopoly rights to a product can be inefficient. In a monopoly, the price that customers are willing and able to pay is above where marginal cost (MC) equals average total cost (ATC) (Cooter and Ulen, 2016, 31).

Economic activity does not occur, however, in the area between Q_c and Q_m because monopolies charge a price above MC (Cooter and Ulen, 2016, 31). The deadweight loss (DWL) demonstrates the inefficiency of monopolies (Cooter and Ulen,

2016, 31). In Figure 1, DWL is represented by the green triangle.

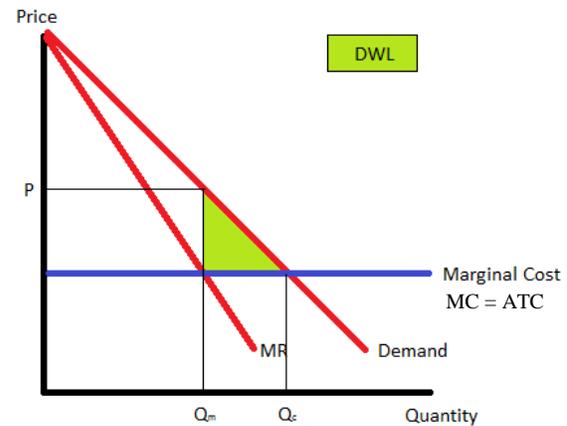


Figure 1

A broader patent, meaning that one patent encompasses related inventions, will encourage fast, duplicative, pre-patent research (Cooter and Ulen, 2016, 120). A narrow patent, meaning that related inventions will get separate patents, will encourage slower, complementary, pre-patent research (Cooter and Ulen, 2016, 120). For vaccines, how broad or narrow a patent is could depend on the technology used, whether the vaccine is one dose or two, and other factors (Cooter and Ulen, 2016, 120).

Ultimately, patent law should strike the right balance in the tradeoff between costs and benefits. Exclusive rights to intellectual property should be beneficial enough to incentivize innovation, but not so comprehensive that the restrictions on output outweigh such benefits (Lindsey 2021). In the end, violating intellectual property law disincentivizes innovation. While there are many complex factors, it is important not to discount the role that innovation incentives play for the development of the vaccines. Pre-pandemic, intellectual property laws have incentivized the foundational pharmaceutical research that has then been used for the

development of vaccines, such as the mRNA research that some vaccine formulas utilized (Baker and Silver 2021). Setting a dangerous precedent of violating intellectual property law could undermine innovative response to future catastrophic events.

Despite the incentives surrounding intellectual property, some still argue that the United States should force pharmaceutical companies to give away the COVID-19 vaccine formulas. The United States is currently helping other countries with their pandemic responses by giving away the vaccines themselves rather than the formulas. Schoen argues, “the developing world lacks the very manufacturing capabilities needed to accomplish the enormous task of manufacturing the necessary number of doses to vaccinate entire continents” (2021). Even if vaccine manufacturing could be outsourced in such a decentralized manner, American manufacturing of vaccines, which is the most advanced and capable in the world, would be greatly stunted (Schoen 2021). Decentralized vaccine production would limit vaccine rollout and distribution to the developing world, not only now but also in the long run, because the United States’ efficiency lends itself to a more successful vaccine production and distribution response (Schoen 21).

Vaccine Production

The complexity of vaccine production is another issue. Experts say that it is highly unlikely for a significant number of manufacturing plants to possess the capabilities to get production up and running immediately (Putterman 2021). Supply chain issues mean that a lack of raw materials and limited production capacity are significant barriers to increasing the global supply of vaccines (Schoen 2021). Furthermore, waiving intellectual property law without teaching manufacturers how to make the vaccine is simply unhelpful (Ott 2021). That approach

would be similar to receiving a cake recipe with the ingredients but not the directions (Ott 2021). It is impossible to replicate the cake (vaccine) without knowing how to put the ingredients together (properly manufacture) (Ott 2021).

Even if it were possible for other manufacturers to start producing vaccines, such a decentralized manufacturing process is problematic as well as inefficient. There is a great potential for discrepancies in the manufacturing processes. Vaccines are biologically complex, and changes in manufacturing processes may affect the safety and effectiveness of the vaccines (Putterman 2021). All aspects of vaccine manufacturing are very strictly controlled by the Food and Drug Administration's (FDA) Good Manufacturing Practices (GMP) (Putterman 2021). Without stringent conditions surrounding the manufacturing practices of vaccines, the proliferation of sub-standard or counterfeit vaccines could pose a significant health crisis (Ott 2021). This, in turn, could greatly undermine public confidence in vaccine safety (Ott 2021). With vaccine mistrust already concerningly prevalent, it is advisable to avoid any circumstances which further call into question the effectiveness or safety of the vaccine. In the end, the efficiency and effectiveness of the original COVID-19 vaccine innovators and manufacturers are in the best interests of everyone.

Global Politics

With such an unprecedented situation, politics are playing an important role in the global response to the pandemic. Vaccine diplomacy is key, and the United States has an opportunity to "improve American geopolitical standing abroad... [by making] its vaccines broadly available" (Macias et al. 2021). Therefore, the United States aiding countries with vaccines, rather than the formula, is the best option. Waiving intellectual property law to give the vaccine formula

effectually leaves other countries on their own, especially if, as discussed earlier, proper instructions and procedures are not passed on. In a proclaimed zero-sum hegemony game with China, giving the vaccine formula away does nothing to further the United States' agenda. Former attorney at the Office of the U.S. Trade Representative, Clete Williams, said that giving the vaccine formula away is a "huge misstep by the Biden Administration that will do nothing to increase vaccine distribution and will endorse China's ability to piggyback on U.S. innovation to further its vaccine diplomacy aims" (Schoen 2021). Another political issue is the increase in jobs for vaccine production and exporting in the United States that is created by domestic production (Macias et al. 2021). Giving away vaccines, instead of the formula, improves U.S. competitiveness and keeps jobs in America, which is more in line with the Biden Administration's stated objectives (Lindsey 2021).

On May 5, 2021, the Biden Administration announced its support for a Trade-Related Intellectual Property Rights (TRIPS) waiver that would violate intellectual property law to give away the vaccine formula (Macias et. al 2021). The TRIPS waiver would set a precedent that disincentivizes innovation of pharmaceutical companies, potentially undermining responses to future catastrophic events. Not surprisingly, "stocks of major pharmaceutical companies that have produced vaccines, including Moderna, BioNTech and Pfizer, dropped sharply after news of the potential [TRIPS] waivers first broke" (Macias et al. 2021). If the Biden Administration's objectives are advancing America's interests, certainly a TRIPS waiver and violating intellectual property law are not the way to do it.

Many people are concerned about rich countries buying up the vaccine first. Distribution of vaccines to high- and upper-middle-income countries accounts for approximately 77% of the 6.41 billion vaccine doses administered globally by October of 2021 (Green 2021). Across the

world, 65.4% people had received at least one dose of a COVID-19 vaccine as of May 2022, compared to 15.7% of individuals in low-income countries (Ritchie et al. 2020). Figures 2, 3 and 4 below show the percent of people who have received at least one dose of a COVID-19 vaccine as of 30 May 2021, 30 October 2021, and 14 May 2022, respectively (Ritchie et al. 2020).

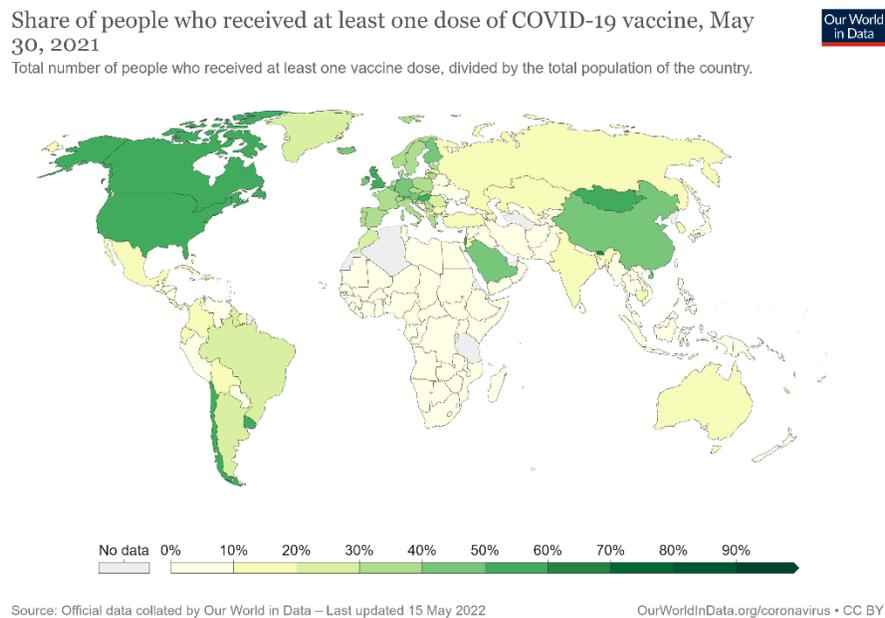


Figure 2

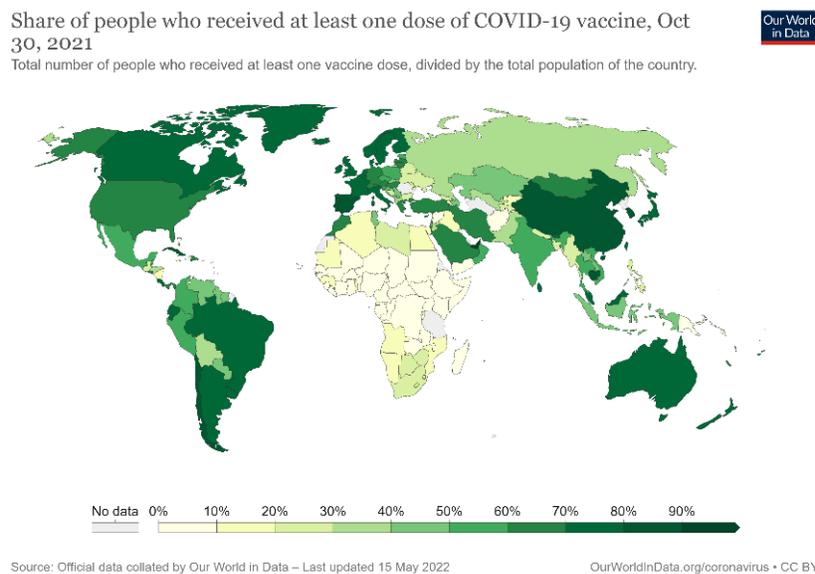


Figure 3

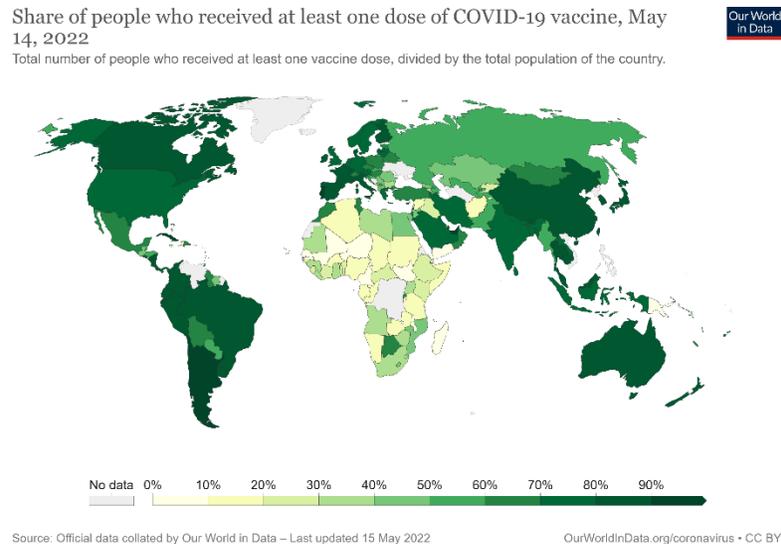


Figure 4

The lack of vaccine distribution to the Global South is a topic of concern, but this is a separate issue and does not mean that violating intellectual property law is the best way to help poorer countries. The United States can and should aid in the distribution of vaccines to the Global South. Access to a vaccine formula is not a panacea to solving the pandemic. Supply chain management, capacity expansion, and innovative technology transfer are necessary for increasing the vaccine supply and reach (Lindsey 2021).

The startling disparity in world vaccine distribution has highlighted the inherent inequality in the pandemic response to the Global South. Low vaccination rates in the Global South have spillover effects on the rest of the world. The COVID-19 variant that originated in South Africa has had adverse effects on Britain, a country with a strong vaccine rollout (Apuzzo and Gebrekidan 2021). Vocal proponents of giving away the patents cite these inequalities but lack robust evidence that such a plan would be more effective than vaccine distribution. There is

no guarantee that waiving patent law will increase distribution and stop variants, due to supply chain and manufacturing issues discussed in this paper.

Waiving patent law reduces profits for pharmaceutical companies, but many argue they have already profited from their innovation. In 2021, Pfizer made nearly \$37 billion from sales of its COVID-19 vaccine (Kollewe 2021). Pfizer is charging the United States \$19.50 per dose of the vaccine, half price for middle-income countries, and at cost for the rest (Sagonowsky 2021, Baker and Silver 2021). Top Pfizer executive Frank D'Amelio called this "pandemic pricing," compared to the \$150 or more Pfizer would normally get per dose (Sagonowsky 2021). How deserving pharmaceutical companies might be does not change the idea that without high profits, future innovation may be stunted. Proponents that cite large profits earned by Big Pharma don't provide data to show that if given the patent formulas, developing countries would quickly be able to produce safe and effective vaccines.

Some view this debate as one between Big Pharma's profits and the global public health. Humanitarian efforts, however, are in line with protecting intellectual property law. Violating intellectual property law disincentivizes innovation and would not necessarily expedite global vaccination rates. Ultimately, the end goal should be that of global safety and mass vaccination. The best way to achieve this goal is not by violating intellectual property law and giving away the vaccine formula.

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