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**Global health inequality threatens progress in fight vs COVID-19 encouraging vaccine resistant mutations**

**Fink 7-30**-21

(Jenni, <https://www.newsweek.com/who-warns-world-blind-understanding-covid-spread-hurting-ability-end-pandemic-1614722>)

A lack of testing for COVID-19 in parts of the world is preventing countries from having a clear picture of how the virus is spreading and therefore hurting the world's chances at **fighting the virus and ending the pandemic**, according to the World Health Organization. **Health inequities** throughout the world have plagued the global response to COVID-19 from the outset and WHO has pushed higher income countries to help lower income countries in the interest of ending the pandemic. Along with restricted access to vaccines, lower income countries have struggled to have sufficient testing, meaning the virus is likely going undetected in certain areas, further enabling its ability to spread. Low testing rates is "leaving the world blind to understanding where the disease is and how it's changing," Dr. Tedros Adhanom Ghebreyesus, director general of the WHO said on Friday during a press briefing. Without improving global testing rates, Ghebreyesus said the world can't "fight the disease" or mitigate the risk it poses to people around the globe. who blind covid spread cases On Friday, the World Health Organization warned the world is "blind" to how COVID-19 is spreading because of a lack of testing in certain places. W,HO Director-General Tedros Adhanom Ghebreyesus attends a daily press briefing on the new coronavirus dubbed COVID-19, at the WHO headquaters on March 2, 2020, in Geneva. FABRICE COFFRINI//AFP/GETTY IMAGES NEWSWEEK NEWSLETTER SIGN-UP > One of Ghebreyesus' biggest frustrations with the pandemic response is the failure to **evenly distribute the vaccine** around the world. In some countries, like the United States and other higher-income nations, significant portions of the population have been vaccinated. While those large vaccinated populations help reduce the spread of the virus in some areas, other countries, especially those in Africa, haven't been able to vaccinate even 10 percent of their population. This puts the entire world at risk because when the virus is able to spread throughout communities it **has the ability to mutate**, thereby increasing the possibility that a mutation could **evade the vaccines**. It's a scenario public health officials have been warning about for months and Ghebreyesus said on Friday that "hard won **gains are in jeopardy**" or have already been lost because the virus has been able to spread. Nearly 30 countries have high or rising oxygen needs and the shortage of life-saving oxygen could lead to increased deaths. More than 196 million cases of COVID-19 have been reported around the world, according to a Johns Hopkins University tracker, and more than 4.2 million people have died. Ghebreyesus suspected the number of cases would top 200 million within the next two weeks and warned that health systems in many countries **are being overwhelmed.** Preventing hospitals from exceeding capacity was a massive concern when the pandemic first broke out and a year later, parts of the U.S. are having their health systems strained as the more transmissible Delta variant spreads. On Thursday, Arkansas Governor Asa Hutchinson declared a public health emergency that allows the state to bring in health care workers from outside Arkansas and makes it easier for retired health care workers and medical students to become licensed. The goal is to help alleviate stress on health care systems and Hutchinson said they've had people waiting in ambulances because there wasn't an open spot in a hospital. That strain will only become more exacerbated if a mutation occurs that evades the vaccine, as inoculations have proven effective at helping to keep people out of the hospital. Ghebreyesus warned that more variants will emerge if global access to vaccines and testing doesn't improve. "The pandemic will end when the world chooses to end it. It is in our hands. We have all the tools we need. We can prevent this disease. We can test for it and we can treat it," Ghebreyesus said.

**IP protections are the vital internal link to reduce vaccine inequality. Empirics disprove all pro patent arguments**

**Kumar, PhD, 7-12**-21

(Rajeesh, Associate Fellow Manohar Parrikar Institute for Defence Studies and Analysis, https://www.idsa.in/issuebrief/wto-trips-waiver-covid-vaccine-rkumar-120721)

In October 2020, India and South Africa had submitted a proposal to the World Trade Organization (WTO), suggesting a waiver of certain provisions of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement for the “prevention, containment and treatment of COVID-19”. The proposal seeks the waiver of “the implementation, application, and enforcement of sections 1, 4, 5 and 7 of part II of the TRIPS agreement”, which are stipulations referring to copyright, industrial design, patents, and undisclosed information (trade secrets).1 The proponents of the proposal argue that a waiver will **enable timely and equitable access** to affordable health products and technologies, including vaccines. Though many member countries had supported and co-sponsored the proposal, a small but influential group of countries, mainly Australia, Canada, the European Union (EU), Japan, the United Kingdom (UK) and the United States (US), opposed it. They argued that existing exceptions under the TRIPS Agreement are sufficient to address the concerns mentioned in the proposal. This resulted in sidelining of the waiver proposal for months. However, on 5 May 2021, the Joseph Biden administration announced its support for waiving intellectual property protections for COVID-19 vaccines.2 It was a significant step towards breaking the seven-month gridlock, and led to many more countries modifying their position on the waiver proposal. On 25 May 2021, the co-sponsors of the waiver proposal submitted a revised proposal that specified the scope of the waiver as applying to “health products and technologies” and also added a section on the proposed duration of the waiver, i.e., three years.3 At present, more than 100 countries, including the US and China support this proposal. The principal opponent of the waiver is the EU and in June 2021, it submitted an alternative proposal to the TRIPS Council, which requested to keep TRIPS’ provisions intact and focused on compulsory licensing and removing vaccine export restrictions to address the concerns raised by India and South Africa.4 The EU proposal also stated that the TRIPS Agreement does not prevent countries from taking measures to protect public health.5 At the meeting of the TRIPS Council on 8–9 June 2021, the member states agreed to text-based negotiations focusing on two proposals tabled by members. The members also decided to hold a series of meetings till the end of July 2021 to take stock of the text-based negotiations. However, the latest developments show that the waiver discussions hit a hurdle due to a split between the developed and developing countries over the negotiation text. This brief discusses how TRIPS becomes a barrier to the equitable access of COVID-19 vaccines. It also examines how a waiver will help India in its fight against COVID-19 at home and abroad. TRIPS and its Exceptions TRIPS, a comprehensive multilateral agreement on Intellectual Property (IP), was an outcome of the Uruguay Round (1986–94) of negotiations of the General Agreement on Tariffs and Trade (GATT). The Agreement came into force on 1 January 1995 and offers a minimum standard of protection for Intellectual Property Rights (IPR).6 In WTO, IPR are divided into two main categories. First, copyright and related rights (Articles 9 to 14, Part II of the TRIPS Agreement). Second, industrial property that includes trademarks, geographical indications, industrial designs, patents, integrated circuit layout designs, and undisclosed information (Articles 15 to 38, Part II of the TRIPS Agreement).7 Article IX.3 and IX.4 of the Marrakesh Agreement Establishing the WTO deals with TRIPS waivers. Article IX.3 says that in “exceptional circumstances” the Ministerial Conference may waive off an obligation imposed on WTO member countries.8 Such a decision requires the support of three-fourths of the WTO membership. According to Article IX.4, any waiver granted for more than one year will be reviewed by the Ministerial Conference. Based on the annual review, the Conference may extend, modify, or terminate the waiver. The TRIPS Agreement provides some flexibility primarily in the form of compulsory licensing and research exceptions through Articles 30 and 31. While Article 30 permits WTO members to make limited exceptions to patent rights, Article 31 provides a detailed exception, provided certain conditions are met. Compulsory licensing is the process of granting a license by a government to use a patent without the patent holder's consent. Article 31 permits granting compulsory license under circumstances such as “national emergencies”, “other circumstances of extreme urgency”, “public noncommercial use”, or against “anti-competitive” practices.9 In addition to these original waivers, the Declaration on the TRIPS Agreement and Public Health, adopted at the 2001 Doha Ministerial Meeting, also recognises some exceptions, for instance, in situations of a public health emergency, member countries have the freedom to determine the grounds upon which compulsory licenses are granted. Similarly, under Article 66.1, the least developed countries (LDCs) are given waivers for implementing TRIPS on pharmaceuticals till 1 January 2033. COVID-19 and TRIPS Waiver Two significant factors rekindled the debate on TRIPS waiver for essential medical products—first, vaccine inequity, and second, the insufficiency of existing waiver provisions in fighting the COVID-19 pandemic. COVID-19 is an **exceptional circumstance**, and **equitable global access** to the vaccine is necessary to **bring the pandemic under control**. However, the world is witnessing quite the reverse, i.e., **vaccine nationalism**. Vaccine nationalism is “my nation first” approach to securing and stockpiling vaccines before making them available in other countries. A TRIPS waiver would be instrumental in addressing the **growing inequality in the production**, distribution, and pricing of the COVID-19 vaccines. Vaccine Inequity According to Duke Global Health Innovation Center, which monitors COVID-19 vaccine purchases, rich nations representing just 14 per cent of the world population have bought up to 53 per cent of the most promising vaccines so far. As of 4 July 2021, the high-income countries (HICs) purchased more than half (6.16 billion) vaccine doses sold globally. At the same time, the low-income countries (LICs) received only 0.3 per cent of the vaccines produced. The low and middle-income countries (LMICs), which account for 81 per cent of the global adult population, purchased 33 per cent, and COVAX (COVID-19 Vaccines Global Access) has received 13 per cent.10 Many HICs bought enough doses to vaccinate their populations several times over. For instance, Canada procured 10.45 doses per person, while the UK, EU and the US procured 8.18, 6.89, and 4.60 doses per inhabitant, respectively.11 Source:“Tracking COVID-19 Vaccine Purchases Across the Globe”, Duke Global Health Innovation Center, Updated 9 July 2021. Consequently, there is a significant disparity between HICs and LICs in vaccine administration as well. As of 8 July 2021, 3.32 billion vaccine doses had been administered globally.12 Nonetheless, **only one per cent** of people in LICs have been given at least one dose. While in HICs almost one in four people have received the vaccine, in LICs, it is one in more than 500. The World Health Organization (WHO) notes that about 90 per cent of African countries will miss the September target to vaccinate at least 10 per cent of their populations as a third wave looms on the continent.13 South Africa, the most affected African country, for instance, has vaccinated less than two per cent of its population of about 59 million. This is in contrast with the US where almost 47.5 per cent of the population of more than 330 million has been fully vaccinated. In Sub-Saharan Africa, vaccine rollout remains the slowest in the world. According to the International Monetary Fund (IMF), at current rates, by the end of 2021, a massive global inequity will continue to exist, with Africa still experiencing meagre vaccination rates while other parts of the world move much closer to complete vaccination.14 This vaccine inequity is not only morally indefensible but also **clinically counter-productive**. If this situation prevails, LICs could be waiting until 2025 for vaccinating half of their people. Allowing most of the world’s population to go unvaccinated will also **spawn new virus mutations, more contagious viruses** leading to a steep rise in COVID-19 cases. Such a scenario could cause **twice as many deaths** as against distributing them globally, on a priority basis. Preventing this humanitarian catastrophe requires **removing all barriers** to the production and distribution of vaccines. TRIPS is one such barrier that prevents vaccine production in LMICs and hence its equitable distribution. TRIPS: Barrier to Equitable Health Care Access The opponents of the waiver proposal argue that IPR are not a significant barrier to equitable access to health care, and existing TRIPS flexibilities are sufficient to address the COVID-19 pandemic. **However, history suggests the contrary.** For instance, when South Africa passed the Medicines and Related Substances Act of 1997 to address the HIV/AIDS public health crisis, nearly 40 of world’s largest and influential pharma companies took the South African government to court over the violation of TRIPS. The Act, which invoked the compulsory licensing provision, allowed South Africa to produce affordable generic drugs.15 The Big Pharma also lobbied developed countries, particularly the US, to put bilateral trade sanctions against South Africa.16 Similarly, when Indian company Cipla decided to provide generic antiretrovirals (ARVs) to the African market at a lower cost, Big Pharma retaliated through patent litigations in Indian and international trade courts and branded Indian drug companies as thieves.17 Another instance was when Swiss company Roche initiated patent infringement proceedings against Cipla’s decision to launch a generic version of cancer drug, “erlotinib”. Though the Delhi High Court initially dismissed Roche's appeal by citing “public interest” and “affordability of medicines,” the continued to pressure the generic pharma companies over IPR. 18 Likewise, Pfizer’s aggressive patenting strategy prevented South Korea in developing pneumonia vaccines for children.19 A recent document by Médecins Sans Frontières (MSF), or Doctors Without Borders, highlights various instances of how **IP hinders manufacturing and supply of diagnostics,** medical equipment, treatments and vaccines during the COVID-19 pandemic. For instance, during the peak of the COVID-19 first wave in Europe, Roche rejected a request from the Netherlands to release the recipe of key chemical reagents needed to increase the production of diagnostic kits. Another example was patent holders threatening producers of 3D printing ventilators with patent infringement lawsuits in Italy.20 The MSF also found that patents pose a severe threat to access to affordable versions of newer vaccines.21 Source:“COVID-19 Vaccine R&D Investments”, Global Health Centre, Graduate Institute, Geneva, Updated 9 July 2021. The opponents of the TRIPS waiver also argue that **IP is the incentive for innovation** and if it is undermined, future innovation will suffer. However, most of the COVID-19 medical innovations, particularly vaccines, are developed with **public financing assistance**. Governments spent billions of dollars for COVID-19 vaccine research. Notably, out of $6.1 billion in investment tracked up to July 2021**, 98.12** per cent was public funding.22 The US and Germany are the largest investors in vaccine R&D with $2.2 billion and $1.5 billion funding. Source:“COVID-19 Vaccine R&D Investments”, Global Health Centre, Graduate Institute, Geneva, Updated 9 July 2021. Private companies received 94.6 per cent of this funding; Moderna received the highest $956.3 million and Janssen $910.6 million. Moreover, governments also invested $50.9 billion for advance purchase agreements (APAs) as an incentive for vaccine development. A recent IMF working paper also notes that **public research institutions** were a key driver of the COVID-19 R&D effort—accounting for 70 per cent of all COVID-19 clinical trials globally.23 The argument is that vaccines are developed with the support of substantial public financing, hence there is a public right to the scientific achievements. Moreover, private companies reaped billions in profits from COVID-19 vaccines. Source: Katharina Buchholz, “COVID-19 Vaccines Lift Pharma Company Profits”, Statista, 17 May 2021. One could argue that since the US, Germany and other HICs are spending money, their citizens are entitled to get vaccines first, hence vaccine nationalism is morally defensible. Nonetheless**, it is not the case**. The TRIPS Agreement includes several provisions which mandates promotion of technology transfer from developed countries to LDCs. For instance, Article 7 states that "the protection and enforcement of IP rights should contribute to the promotion of technological innovation and the transfer and dissemination of technology, to the mutual advantage of producers and users of technical knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."24 Similarly, Article 66.2 also mandates the developed countries to transfer technologies to LDCs to enable them to create a sound and viable technological base. The LMICs opened their markets and amended domestic patent laws favouring developing countries’ products against this promise of technology transfer. Another argument against the proposed TRIPS waiver is that a waiver would not increase the manufacturing of COVID-19 vaccines. Indeed, one of the significant factors contributing to vaccine inequity is the lack of manufacturing capacity in the global south. Further, a TRIPS waiver will not automatically translate into improved manufacturing capacity. **However, a waiver would be the first but essential step to increase manufacturing capacity worldwid**e. For instance, to export COVID-19 vaccine-related products, countries need to ensure that there are no IP restrictions at both ends – exporting and importing. The market for vaccine materials includes consumables, single-use reactors bags, filters, culture media, and vaccine ingredients. Export blockages on raw materials, equipment and finished products harm the overall output of the vaccine supply chain. If there is no TRIPS restriction, more governments and companies will invest in repurposing their facilities. Similarly, the arguments such as that no other manufacturers can carry out the complex manufacturing process of COVID-19 vaccines and generic manufacturing as that **would jeopardise quality**, have also been **proven wrong in the past**. For instance, in the early 1990s, when Indian company Shantha Biotechnics approached a Western firm for a technology transfer of Hepatitis B vaccine, the firm responded that “India cannot afford such high technology vaccines… And even if you can afford to buy the technology, your scientists cannot understand recombinant technology in the least.”25 Later, Shantha Biotechnics developed its own vaccine at $1 per dose, and the UNICEF (United Nations Children’s Emergency Fund) mass inoculation programme uses this vaccine against Hepatitis B. In 2009, Shantha sold over 120 million doses of vaccines globally. India also produces high-quality generic drugs for HIV/AIDS and cancer treatment and markets them across the globe. Now, a couple of Indian companies are in the last stage of producing mRNA (Messenger RNA) vaccines.26 Similarly, Bangladesh and Indonesia claimed that they could manufacture millions of COVID-19 vaccine doses a year if pharmaceutical companies share the know-how.27 Recently, Vietnam also said that the country could satisfy COVID-19 vaccine production requirements once it obtains vaccine patents.28 Countries like the United Arab Emirates (UAE), Turkey, Cuba, Brazil, Argentina and South Korea have the capacity to produce high-quality vaccines but lack technologies and know-how. However, Africa, Egypt, Morocco, Senegal, South Africa and Tunisia have limited manufacturing capacities, which could also produce COVID-19 vaccines after repurposing. Moreover, COVID-19 vaccine IPR runs across the entire value chain – vaccine development, production, use, etc. A mere patent waiver may not be enough to address the issues related to its production and distribution. What is more important here is to share the technical know-how and information such as trade secrets. Therefore, the existing TRIPS flexibilities, such as compulsory and voluntary licensing, are insufficient to address this crisis. Further, compulsory licensing and the domestic legal procedures it requires is cumbersome and not expedient in a public health crisis like the COVID-19 pandemic.

**Continued COVID spread causes great power war – diversion, nationalism, psychology**

**Kitfield 20**

(James, the only three-time winner of the prestigious Gerald R. Ford Award for Distinguished Reporting on National Defense, <https://breakingdefense.com/2020/05/will-covid-19-kill-the-liberal-world-order/>, 5-22)

For a brief moment it seemed that the worst global pandemic in a century might lead to increased comity between the United States, China and Russia after years of geopolitical eye-gouging. As the virus spread there were early signs of a pause in the escalating cycle of military brinksmanship, cyberattacks, disinformation campaigns and trade wars that has badly shaken the rules-based international order in this era of great power competition. Beijing seemed to initially embrace a spirit of cooperation when it donated protective gear and testing equipment to hard hit countries in Europe. President Trump for months was uncharacteristically effusive in his praise of Chinese President Xi Jinping’s efforts to combat the virus. Russian President Vladimir Putin got into the soft power act in early April when he dispatched an An-124 military transport to New York filled with donated masks and ventilators. (Of course, you can also argue it was a highly effective information operation designed to undermine U.S. standing in the world.) That moment was short lived. “Unfortunately, this crisis is likely to unfold in three consecutive waves, with a public health crisis followed by an economic crisis, quite possibly followed by a security crisis,” said David Kilcullen, author of the recent book “The Dragons and Snakes: How the Rest Learned to Fight the West,” and a former special adviser to Gen. David Petraeus in Iraq, and the U.S. Secretary of State. The United States is already experiencing high levels of domestic unrest at a time of paralyzing partisan rancor, he noted, and the discord will certainly increase as the presidential election nears in November. Adding to that combustible mixture is likely to be a **second wave of the virus** expected to hit in the fall, and foreign actors like Russian and China determined to use disinformation to stoke domestic divisions during the election. “Given the likelihood of internal instability and anti-government anger here and around the world, there will be a huge incentive for leaders who personalize politics like Trump, [Russian President Vladimir] Putin and [Chinese President] Xi Jinping **to look for external scapegoats for their domestic troubles**, which has already started to happen,” said Kilcullen. “This crisis also comes at a point when the international system that we’ve known since the end of World War II **was already rotting and weaker than it appears**. It may only take **one big shock to bring that whole structure down,** and, if we’re not very careful, the pandemic could be that shock. So this is the **most dangerous geopolitical dynamic** I have seen in my entire career.” Chinese President Xi Jinping inspects PLA troops As it became clear the Chinese Communist Party covered up the initial outbreak of the novel coronavirus in Wuhan, wasting precious time and allowing it to blossom into a global pandemic, Beijing launched a campaign of intimidation and economic threats to mute international criticism. Borrowing a page from Russian disinformation operations, Beijing posited the conspiracy theory that the virus originated with the U.S. military. Both China and Russia pushed alarmist narratives about the pandemic on social media to sow division and panic inside the United States. Much of the protective equipment Beijing “donated” to the West carried a price tag and turned out to be defective. In his own campaign of blame shifting and heated rhetoric, President Donald Trump accused China of being responsible for an attack on the United States that “is worse that Pearl Harbor,” and “worse than the World Trade Center” that fell in the 9/11 terrorist attacks. Chinese incompetence in dealing with the virus, Trump tweeted this week, is responsible for “mass Worldwide killing!” Trump darkly hinted in mid-April that he had information that a virology lab in Wuhan played an important role in the virus’ creation, even though the U.S. Intelligence Community consensus was that the virology lab in Wuhan had nothing to do the virus’ creation or origins. Secretary of State Mike Pompeo insisted there is “enormous evidence” the coronavirus originated in that lab. “We greatly underestimated the degree to which Beijing is ideologically and politically hostile to free nations,” Pompeo told reporters this week, after sending a rare, high-level message of congratulations to recently reelected Taiwanese President Tsai Ing-Wen, who has rejected the “one country, two systems” construct that has kept the peace between China and Taiwan for nearly half a century. As the Trump administration weighs retribution against China, it has continued to ratchet up the rhetoric and provocations, **angering and worrying allies** by cutting critical funding to the World Health Organization (WHO) in the midst of the pandemic, and boycotting a virtual meeting of G-20 nations that attempted to coordinate an international response to the crisis, leaving a leadership gap that China was happy to help fill. Open Skies surveillance plane On the Russian front, the Trump administration has reportedly decided to withdraw from the three-decade old Open Skies Treaty that allows 34 countries to fly over each other’s territory with sensors to confirm they are not preparing military action. The trump White House says the Russians are violating the accord by forbidding flights over military exercises and using its own flights over the United States to identify critical infrastructure that can be hit by cyberattacks.Meanwhile, populist leaders and autocratic regimes around the world are using the threat of the pandemic to assume extraordinary powers and crack down on their political opposition in what the United Nations Special Rapporteur for Counterterrorism and Human Rights called an “an epidemic of authoritarianism,” according to the The New York Times. Shaky World Order Even before the pandemic the post-WW II international order that the United States constructed and led for more than half a century was on shaky ground. The global institutions, alliances and rules governing international relations has been challenged by assertive autocratic regimes like China and Russia, and eroded from within by inward-looking nationalist-populists movements spreading throughout the Western democracies. The liberal international order has also been largely abandoned by its leader as Donald Trump’s administration retreats further into “America First” isolationism. The Trump doctrine in international affairs actively seeks to undermine the institutions of global order, whether it’s the World Health and Trade Organizations, the UN, the European Union or NATO. The administration has rejected or abolished all manner of multilateral agreements and treaties designed to peacefully constrain international rivalries, including the Trans-Pacific Partnership Agreement, the Paris Climate Agreement, the Iran nuclear deal, the Intermediate-Range Nuclear Forces treaty, and quite possibly next year the New Strategic Arms Reduction Treaty (New START). A Dark History History is rife with cautionary examples of natural disasters or economic crises conflating with geopolitical tensions, with cataclysmic results. The catastrophic 1918 Spanish flu pandemic, which killed more than 20 million victims worldwide, was accelerated and spread by troop movements during World War I. With many Americans disillusioned by the war and loss, the United States turned insular and isolationist during the 1920s, rejecting the League of Nations, dramatically curtailing immigration and erecting steep tariff barriers to trade. Much of the rest of the world followed suit. The U.S. stock market crash of 1929 was compounded the next year by one of the worst droughts in history. When the Japanese invaded China two years later, and Adolf Hitler became German chancellor soon after, there was no League of Nations nor stabilizing trading systems to contain the war fever that swept the globe and became World War II. “When you think back to 1918 and the Spanish flu, it’s worth remembering that more people died in the second wave than the first, and the Great Depression and the 1930s taught us that bad economic conditions can be transformative,” said Joseph Nye, a professor emeritus and former Dean of the Harvard’s Kennedy School of Government, speaking recently on a videoconference organized by The National Interest. “The point is, in the current pandemic we’re likely only in **Act 1 of a multi-act play.”** Combustible Leadership The very real potential for the pandemic crisis to propel the major powers towards outright military conflict was noted recently by the Chinese Ministry of State Security, Beijing’s top intelligence agency. In a report for Xi Jinping and the senior Chinese leadership it reportedly concluded that global anti-China sentiment being stoked by the Trump administration has reached its highest peak since the 1989 Tiananmen Square crackdown, and as a result China needs to be prepared for a worst-case scenario of **armed confrontation with the United States**. Despite the warnings, Xi Jinping has doubled down in recent months on provocative military maneuvers in its neighboring seas, sending its Liaoning carrier battle group and military flights off the coast of Taiwan; conducting anti-submarine exercises in contested areas of the South China Sea; ramming and sinking a Vietnamese fishing boat near the disputed Paracel Islands; dispatching a fishing boat “militia” to harass Philippine counterparts near the contested Spratly Islands; and harassing a Malaysian drillship. The littoral combat ship USS Montgomery conducts operations near drillship, the West Capella, in Malaysian waters. Some analysts see those moves as an attempt by Xi Jinping to show strength and bolster his image at home among a Chinese populace wearied by the pandemic shutdowns and economic disruptions. Those provocations are exactly the kind of saber-rattling that can escalate **dangerously in a time of crisis.** George Beebe is a former director of the CIA’s Russia analysis section, and author of the book “The Russia Trap: How Our Shadow War with Russia Could Spiral into Catastrophe.” “My concern is that the major power leaders Putin, Xi and Trump all tend to personalize international relations and politics. They are all going through severe economic and political distress. Each of them is convinced that their rivals are trying to **exploit the pandemic crisis, and not one of them is dealing from a position of strength and confidence**,” he told me. Putin has long felt betrayed and threatened by the United States, Beebe noted, and Xi Jinping is convinced that America is trying to thwart China’s rise. One of the few constants in Trump’s worldview is the conviction that China has taken advantage of the United States with trade going back decades. “So there’s a lot of fear and emotion and very little trust in the relationships between these leaders during a time of great strain, and their communications and diplomatic mechanisms to manage a crisis if one occurs have atrophied,” said Beebe. “Given that personalities and personal relationships among national leaders are far more important in international affairs than a lot of people appreciate, I do worry that we’re entering a very dangerous period when cooler heads may not prevail among the great power leaders.”

**Taiwan buying foreign vaccines or receiving donations is seen as a move to independence – sparks Chinese aggression**

**Zhong and Schuetze, 21**

Zhong, R., Schuetze, C. F. (2021, June 16). Taiwan Accuses China of Blocking Access to BioNTech Vaccines. The New York Times. Raymond Zhong joined The New York Times as a technology reporter in 2017. Christopher F. Schuetze joined the Berlin bureau of The New York Times in 2018 to help cover German politics, society and breaking news. https://www.nytimes.com/2021/06/16/business/taiwan-china-biontech-vaccine.html

The two sides have traded accusations about whether political motivations are keeping the Taiwanese people from receiving immunizations amid the island’s first major Covid-19 outbreak. TAIPEI, Taiwan — This is the age of “vaccine diplomacy.” It is also the era of its bitter, mudslinging opposite. For months, Taiwan has been unable to purchase doses of the BioNTech coronavirus vaccine, and the island’s leaders blame “Chinese intervention.” China, which regards Taiwan as its own territory, calls this accusation “fabricated out of nothing.” It is unclear what steps, if any, the government in Beijing has taken to disrupt Taiwan’s dealings with BioNTech, the German drugmaker that developed the vaccine with Pfizer. BioNTech declined to comment. But the crux of the problem is that a Chinese company claims the exclusive commercial rights to distribute BioNTech’s vaccine in Taiwan. And for many people in the self-governing democracy, buying shots from a mainland Chinese business is simply unpalatable. The impasse is exacerbating Taiwan’s vaccine shortage as the island confronts its first major outbreak of Covid-19 since the start of the pandemic. It is a bleak illustration of how deeply entrenched the long-running conflict across the Taiwan Strait has become, with a degree of mutual distrust that not even a global medical emergency can allay. Beijing’s efforts to stand between Taiwan and the wider world began spilling into public health a long time ago. China has for years blocked the island from participating in the World Health Assembly, the policy body of the World Health Organization. China has a say in Taiwan’s inoculation campaign because BioNTech last year teamed up with a Shanghai company, Fosun Pharma, to distribute its Covid vaccine in mainland China, Hong Kong, Macau and Taiwan. BioNTech’s partner in the United States, the European Union and other places is Pfizer. China says Taiwan is flouting this arrangement by trying to buy doses directly from BioNTech. Taiwan says it respects the companies’ partnership but hopes their relationship will not get in the way of the island’s vaccine purchases. Beijing also warned against “meddling in China’s internal affairs” after Japan said it was donating 1.2 million AstraZeneca doses to Taiwan. Chinese officials were similarly peeved this month when three U.S. senators visited the island to announce a donation of 750,000 doses. On Tuesday, Taiwan said 28 Chinese military aircraft had entered the island’s southwestern air defense identification zone, the largest such show of force in months. As Covid infections have spread in Taiwan, Chinese representatives have accused the island’s leaders of putting politics above health by refusing to accept Chinese-made vaccines. Chinese state news media has underlined the point by highlighting the “Taiwan compatriots” who have gotten vaccinated in China. “On the vaccine issue or the pandemic issue, I think China is trying to exploit any opportunity they can have,” said Lee Che-chuan of the Institute for National Defense and Security Research, a think tank funded by Taiwan’s government. Beijing, Mr. Lee said, is telling Taiwan: “You are part of China. I can give you vaccines. But if you want to purchase them from some other countries, you have a political purpose: You’re trying to indicate you are independent from China.” Taiwan’s inoculation efforts have taken on greater urgency since a wave of new Covid cases caused the island to enter a soft lockdown last month. The government has placed orders with AstraZeneca, Moderna and two domestic vaccine makers. But shipments have been slow to materialize. Fewer than 5 percent of the island’s 23.5 million people have been vaccinated so far. Taiwan began talking with BioNTech about buying five million doses last August, the island’s health minister, Chen Shih-chung, said during a recent news conference. The two sides had largely agreed on a contract by December, according to Mr. Chen. On Jan. 8, BioNTech approved Taiwan’s draft news releases announcing the deal in Chinese and English. But four hours later, BioNTech came back with a request, Mr. Chen said. The company wanted the word “country” in the Chinese-language news release to be replaced with “Taiwan.” Beijing is extremely sensitive to any suggestion that Taiwan is an autonomous nation. Taiwanese officials agreed to make the change, Mr. Chen said. But BioNTech said it needed to consider the matter further. The deal has been on hold ever since. “It wasn’t because of a problem within the contract, but rather a problem outside the contract,” Mr. Chen said. The chief executive of Fosun Pharma, BioNTech’s partner for Greater China, recently told China’s Xinhua state news agency that the company would gladly supply vaccines to “Taiwan compatriots.” Whether Taiwan would accept those doses is more complicated. Taiwanese law forbids the import of Chinese-made vaccines. But Mr. Chen suggested on Wednesday that Taiwan would be open to importing BioNTech shots if Fosun acted only as their distributor, not manufacturer. Fosun didn’t respond to a request for comment. Recently, discussions have taken place about a vaccine deal for Taiwan that would involve not only BioNTech and Fosun but also Zuellig Pharma, a Swiss-owned health services, cold storage and logistics company, according to two people familiar with the matter. Such a deal might allow BioNTech to honor its partnership with Fosun while also satisfying the Taiwanese authorities by reducing Fosun’s role. Zuellig has worked with Moderna to supply Moderna’s vaccine in Southeast Asia, Hong Kong, Macau and Taiwan. A Zuellig spokeswoman declined to comment, as did Taiwan’s central epidemic command center. BioNTech and Fosun have already delivered vaccines from Germany to Hong Kong and Macau, and they are preparing to manufacture BioNTech’s vaccine at a Fosun facility for the China market. Fosun Pharma’s parent company is Fosun International, a Shanghai-based conglomerate with interests in insurance, property, fashion, retail, tourism and more. In a poll conducted in late May by researchers at Taiwan’s National Chengchi University, three-quarters of respondents said they wouldn’t take a Chinese vaccine.

**The squo is key – Taiwan is the key internal link to US-China war**

**Buckley and Myers, 10-9**-21

Buckley, C., Myers, S. L. (2021, October 9). U.S. and China Enter Dangerous Territory Over Taiwan. The New York Times. Chris Buckley is chief China correspondent and lived in China for most of the past 30 years after growing up in Sydney, Australia. Before joining The Times in 2012, he was a correspondent in Beijing for Reuters. Steven Lee Myers is the Beijing bureau chief for The New York Times. He joined The Times in 1989 and has previously worked as a correspondent in Moscow, Baghdad and Washington. He is the author of “The New Tsar: The Rise and Reign of Vladimir Putin,” published by Alfred A. Knopf in 2015. https://www.nytimes.com/2021/10/09/world/asia/united-states-china-taiwan.html?campaign\_id=9&#38;emc=edit\_nn\_20211010&#38;instance\_id=42511&#38;nl=the-morning&#38;regi\_id=111326935&#38;segment\_id=71276&#38;te=1&#38;user\_id=4ba0fa874fa3253e713b5e8ae88770e2

The 25 Chinese fighter jets, bombers and other warplanes flew in menacing formations off the southern end of Taiwan, a show of military might on China’s National Day, Oct. 1. The incursions, dozens upon dozens, continued into the night and the days that followed and surged to the highest numbers ever on Monday, when 56 warplanes tested Taiwan’s beleaguered air defenses. Taiwan’s jets scrambled to keep up, while the United States warned China that its “provocative military activity” undermined “regional peace and stability.” China did not cower. When a Taiwanese combat air traffic controller radioed one Chinese aircraft, the pilot dismissed the challenge with an obscenity involving the officer’s mother. As such confrontations intensify, the balance of power around Taiwan is fundamentally shifting, pushing a decades-long impasse over its future into a dangerous new phase. After holding out against unification demands from China’s communist rulers for more than 70 years, Taiwan is now at the heart of the deepening discord between China and the United States. The island’s fate has the potential to reshape the regional order and even to ignite a military conflagration — intentional or not. “There’s very little insulation left on the wiring in the relationship,” Danny Russel, a former assistant secretary of state, said, “and it’s not hard to imagine getting some crossed wires and that starting a fire.” China’s military might has, for the first time, made a conquest of Taiwan conceivable, perhaps even tempting. The United States wants to thwart any invasion but has watched its military dominance in Asia steadily erode. Taiwan’s own military preparedness has withered, even as its people become increasingly resistant to unification. All three have sought to show resolve in hopes of averting war, only to provoke countermoves that compound distrust and increase the risk of miscalculation. At one particularly tense moment, in October 2020, American intelligence reports detailed how Chinese leaders had become worried that President Trump was preparing an attack. Those concerns, which could have been misread, prompted Gen. Mark A. Milley, the chairman of the Joint Chiefs of Staff, to call his counterpart in Beijing to assure otherwise. “The Taiwan issue has ceased to be a sort of narrow, boutique issue, and it’s become a central theater — if not the central drama — in U.S.-China strategic competition,” said Evan Medeiros, who served on President Obama’s National Security Council. China’s ambitious leader, Xi Jinping, now presides over what is arguably the country’s most potent military in history. Some argue that Mr. Xi, who has set the stage to rule for a third term starting in 2022, could feel compelled to conquer Taiwan to crown his era in power. Mr. Xi said Saturday in Beijing that Taiwan independence “was a grave lurking threat to national rejuvenation.” China wanted peaceful unification, he said, but added: “Nobody should underestimate the staunch determination, firm will and powerful ability of the Chinese people to defend national sovereignty and territorial integrity.” Few believe a war is imminent or foreordained, in part because the economic and diplomatic aftershocks would be staggering for China. Yet even if the recent flights into Taiwan’s self-declared air identification zone are intended merely as political pressure, not a prelude to war, China’s financial, political and military ascendancy has made preserving the island’s security a gravely complex endeavor. Until recently, the United States believed it could hold Chinese territorial ambitions in check, but the military superiority it long held may not be enough. When the Pentagon organized a war game in October 2020, an American “blue team” struggled against new Chinese weaponry in a simulated battle over Taiwan. An undated photo from Taiwan’s defense ministry showing a Chinese H-6 bomber. The ministry said that H-6 bombers were among the planes that China flew recently near the island. China now acts with increasing confidence, in part because many officials, including Mr. Xi, hold the view that American power has faltered. The United States’ failures with the Covid-19 pandemic and its political upheavals have reinforced such views. Some advisers and former officers in China argue that the United States no longer has the will to send forces if a war were to break out over Taiwan. Under the right conditions, others suggest, the People’s Liberation Army could prevail if it did. “Would the United States court death for Taiwan?” Teng Jianqun, a former Chinese navy captain, said in a recent interview on Chinese television. Such posturing, in turn, ignites more tensions. In Taiwan, China’s military provocations have bolstered political support for the island’s president, Tsai Ing-wen, who has sought to forge ties with countries increasingly wary of China. The Biden administration is trying to bolster Taiwan’s defense capabilities and international standing, hoping to delay or prevent the need for American military intervention. “The three sides have seen their interactions caught in a vicious spiral,” Jia Qingguo, a professor of international relations at Peking University who advises the Chinese government, recently wrote. “The process of vicious interactions between Taipei, Beijing, and Washington resembles the forming of a perfect storm.” Two days after the fall of Kabul in August, as the Biden administration scrambled to evacuate thousands stranded by the American withdrawal, China staged military exercises explicitly designed to show off its prowess. Chinese warships fired missiles into the sea south of Taiwan, while amphibious landing vehicles swept ashore a beach in China. It was one of the largest exercises ever to simulate an invasion across the Taiwan Strait. In previous drills, the People’s Liberation Army maintained a gauze of deniability about its imagined adversary, but this time it left no doubt. One officer on Chinese television warned the United States and Taiwan “not to play with fire on the Taiwan issue and immolate themselves.” The question is whether Mr. Xi intends to act. He has vowed to lead the “great rejuvenation of the Chinese nation,” including bringing Taiwan under Chinese control. Some interpret that to mean within a decade, if not sooner. His hard-line policies have made it less likely that Taiwan could ever willingly agree to China’s terms, especially after Mr. Xi throttled political freedoms in Hong Kong. Every leader since Mao has vowed to absorb Taiwan, but Mr. Xi is the first who commands a military strong enough to make forced unification plausible, albeit still a formidable task. Any assault on Taiwan, which lies 100 miles off the coast, would require overwhelming military advantage. Even if Chinese forces seized control over the island of 24 million, the war would badly shake China’s economy and international relations, while exacting a significant human toll. “Even moderate voices in Beijing have been calling for tossing out peaceful reunification,” said Oriana Skylar Mastro, a fellow at Stanford University’s Freeman Spogli Institute for International Studies. “I think the military option is the option now.” China’s leaders began the long, politically fraught process of overhauling the People’s Liberation Army after watching the United States put its military power on display in the Persian Gulf war against Iraq in 1990. Six years later, they understood just how far behind their military had fallen when the United States dispatched two aircraft carriers near Taiwan in response to China firing missiles into the seas near the island. After the American show of force, China backed down. Robert L. Thomas, a former vice admiral who commanded the United States Navy’s Seventh Fleet in Japan, recalled a meeting with a Chinese admiral in 2015. The admiral told him that the 1996 confrontation still stung nearly two decades later. “It’s clear to me that they won’t allow themselves to be embarrassed again by a Taiwan Strait crisis where the U.S. Seventh Fleet shows up and says, ‘Everybody calm down,’” Mr. Thomas said. Since then, China’s leaders have poured money into the People’s Liberation Army. In a decade, military spending grew by 76 percent, reaching $252 billion in 2020, according to the Stockholm International Peace Research Institute. (The United States spent $778 billion on its military last year.) Mr. Xi has also reorganized the military, raising the status of naval and air forces and pushing commanders to master joint warfare. In an exercise last year, the military conducted a drill that simulated sealing off the Taiwan Strait from outside forces. What was unthinkable in 1996 could now be within reach. The exercise was like “trapping a turtle in a jar,” said a website run by China’s office for Taiwan affairs. When the United States Air Force held its own war games over Taiwan in autumn last year, the outcome rattled Washington’s political and military establishment. In war games since at least 2018, American “blue” teams have repeatedly lost against a “red” team representing a hypothetical Chinese force — in part by design, since the exercises are intended to test officers and war planners. In a game simulating a war around 2030, reported earlier by Defense News, the “blue” team struggled even when given new advanced fighter planes and other weapons still on the Pentagon’s drawing board. The classified game culminated with China launching missile strikes against American bases and warships in the region, and then staging an air and amphibious assault on Taiwan, according to a Defense Department official. The officials concluded that Taiwan, backed by the United States, could hold out for maybe two or three days before its defenses crumbled. The Pentagon’s annual assessments of China’s military have since 2000 chronicled its evolution from a large but ineffective force into a potential rival. Its latest report said Chinese capabilities have already surpassed the American military in some areas, including shipbuilding, conventional ballistic and cruise missiles, and integrated air defense systems. All three would be essential in any conflict over Taiwan. “I worry that they are accelerating their ambitions to supplant the United States,” Admiral Philip S. Davidson, the retiring commander of the Indo-Pacific Command, told the Senate Armed Services Committee in March. “Taiwan is clearly one of their ambitions before then, and I think the threat is manifest during this decade; in fact, in the next six years.” His bleak prediction has since colored debates in Washington over what to do. Some have argued that explicit security guarantees for Taiwan are needed. Others have called for building up of military forces around China, and helping Taiwan to do the same. “To us, it’s only a matter of time, not a matter of if,” Rear Admiral Michael Studeman, the director of intelligence with the United States’ Indo-Pacific Command in Hawaii, said in a July talk, about the possibility of armed conflict over Taiwan.

**Military documents prove that goes nuclear – deterrence doesn't check, reject old defense.**

**Savage 5-22**-21 [Charlie Savage, master’s degree from Yale Law School as part of a Knight Foundation journalism fellowship, author of “Power Wars,” published in 2015, an investigative history of national-security legal policymaking in the Obama administration, and “Takeover,” published in 2007, which chronicles the Bush-Cheney administration’s efforts to expand presidential power. "Risk of Nuclear War Over Taiwan in 1958 Said to Be Greater Than Publicly Known", NY Times, 5-22-2021, accessed 10-30-2021, https://www.nytimes.com/2021/05/22/us/politics/nuclear-war-risk-1958-us-china.html] HWIC

WASHINGTON — When Communist Chinese forces began shelling islands controlled by Taiwan in 1958, the United States rushed to back up its ally with military force — including drawing up plans to carry out nuclear strikes on mainland China, according to an apparently still-classified document that sheds new light on how dangerous that crisis was.

American military leaders pushed for a first-use nuclear strike on China, accepting the risk that the Soviet Union would retaliate in kind on behalf of its ally and millions of people would die, dozens of pages from a classified 1966 study of the confrontation show. The government censored those pages when it declassified the study for public release.

The document was disclosed by Daniel Ellsberg, who leaked a classified history of the Vietnam War, known as the Pentagon Papers, 50 years ago. Mr. Ellsberg said he had copied the top secret study about the Taiwan Strait crisis at the same time but did not disclose it then. He is now highlighting it amid new tensions between the United States and China over Taiwan.

While it has been known in broader strokes that United States officials considered using atomic weapons against mainland China if the crisis escalated, the pages reveal in new detail how aggressive military leaders were in pushing for authority to do so if Communist forces, which had started shelling the so-called offshore islands, intensified their attacks.

The crisis in 1958 instead ebbed when Mao Zedong’s Communist forces broke off the attacks on the islands, leaving them in the control of Chiang Kai-shek’s nationalist Republic of China forces based on Taiwan. More than six decades later, strategic ambiguity about Taiwan’s status — and about American willingness to use nuclear weapons to defend it — persists.

The previously censored information is significant both historically and now, said Odd Arne Westad, a Yale University historian who specializes in the Cold War and China and who reviewed the pages for The New York Times.

“This confirms, to me at least, that we came closer to the United States using nuclear weapons” during the 1958 crisis “than what I thought before,” he said. “In terms of how the decision-making actually took place, this is a much more illustrative level than what we have seen.

”Drawing parallels to today’s tensions — when China’s own conventional military might has grown far beyond its 1958 ability, and when it has its own nuclear weapons — Mr. Westad said the documents provided fodder to warn of the dangers of an escalating confrontation over Taiwan.

Even in 1958, officials doubted the United States could successfully defend Taiwan using only conventional weapons, the documents show. If China invaded today, Mr. Westad said, “it would put tremendous pressure on U.S. policymakers, in the case of such a confrontation, to think about how they might deploy nuclear weapons.”“That should be sobering for everyone involved,” he added.ImageDaniel Ellsberg in 1973.

He said he had copied the top secret study about the Taiwan Strait crisis when he received the Pentagon Papers.Credit...Ron Frehm/Associated Press

In exposing a historical antecedent for the present tensions, Mr. Ellsberg said that was exactly the takeaway he wanted the public to debate. He argued that inside the Pentagon, contingency planning was likely underway for the possibility of an armed conflict over Taiwan — including what to do if any defense using conventional weapons appeared to be falling short.

“As the possibility of another nuclear crisis over Taiwan is being bandied about this very year, it seems very timely to me to encourage the public, Congress and the executive branch to pay attention to what I make available to them,” he said about what he characterized as “shallow” and “reckless” high-level discussions during the 1958 Taiwan Strait crisis.

He added, “I do not believe the participants were more stupid or thoughtless than those in between or in the current cabinet.”

Among other details, the pages that the government censored in the official release of the study describe the attitude of Gen. Laurence S. Kuter, the top Air Force commander for the Pacific. He wanted authorization for a first-use nuclear attack on mainland China at the start of any armed conflict. To that end, he praised a plan that would start by dropping atomic bombs on Chinese airfields but not other targets, arguing that its relative restraint would make it harder for skeptics of nuclear warfare in the American government to block the plan.

“There would be merit in a proposal from the military to limit the war geographically” to the air bases, “if that proposal would forestall some misguided humanitarian’s intention to limit a war to obsolete iron bombs and hot lead,” General Kuter said at one meeting.

At the same time, officials considered it very likely that the Soviet Union would respond to an atomic attack on China with retaliatory nuclear strikes. (In retrospect, it is not clear whether this premise was accurate. Historians say American leaders, who saw Communism as a monolithic global conspiracy, did not appreciate or understand an emerging Sino-Soviet split.)

But American military officials preferred that risk to the possibility of losing the islands. The study paraphrased Gen. Nathan F. Twining, the chairman of the Joint Chiefs of Staff, as saying that if atomic bombings of air bases did not force China to break off the conflict, there would be “no alternative but to conduct nuclear strikes deep into China as far north as Shanghai.”

He suggested that such strikes would “almost certainly involve nuclear retaliation against Taiwan and possibly against Okinawa,” the Japanese island where American military forces were based, “but he stressed that if national policy is to defend the offshore islands then the consequences had to be accepted.”

**Even a limited nuclear war would cause extinction – best science.**

**Cribb 17**

(Julian, BA Classics@WesternAusstralia, FoundingEditor@ScienceAlert, Surviving the 21st Century, Springer)

The most publicised horrors of nuclear war, over the past half-century, were blast damage, fi reball burns and radiation sickness, as they were in Hiroshima and Nagasaki, leading to a perception that those well away from target areas might be spared. Scientists however demur, arguing that the biggest killer of all is likely to be a ‘ nuclear winter ’ , triggered by the immense quantities of dust and smoke from burning cities and forests lofted into the upper atmosphere, and the simultaneous stripping of the Earth’s protective ozone layer: “In the aftermath… vast areas of the earth could be subjected to prolonged darkness, abnormally low temperatures, violent windstorms, toxic smog and persistent radioactive fallout.” This would be compounded by the collapse of farming and food production, transport, energy grids, healthcare, sanitation and central government. Even in regions remote from the actual blasts people would starve, die from freezing temperatures as much as 30 °C below normal, from radiation sickness and a pandemic of skin cancers, pollution and loss of immunity to ordinary diseases. The nuclear winter is in effect the antithesis of global warming, a shock cooling of the entire planet, but one lasting several years only. However, “A number of biologists contend **the extinction of** many species … - including **the human species— is a real possibility**,” they say (Turco et al. 2012 ). In the 1980s a group of courageous scientists 1 alerted the leaders of both the US and Russia to the dangers of a nuclear winter. In an atomic war, they warned, there will be no winners. Th en-Soviet president Mikhail Gorbachev took their counsel to heart: “Models made by Russian and American scientists showed that a nuclear war would result in a nuclear winter that would be extremely destructive to all life on Earth; the knowledge of that was a great stimulus to us, to people of honor and morality, to act in that situation,” he subsequently related (Hertsgard 2000 ). US President Ronald Reagan concurred: “A nuclear war cannot be won and must never be fought,” he said in his State of the Union Address in 1984 (Reagan 1984 ). Marking this watershed moment in history Al Gore recounted in his Nobel Prize oration in 2007 “More than two decades ago, scientists calculated that nuclear war could throw so much debris and smoke into the air that it would block life- giving sunlight from our atmosphere, causing a ‘nuclear winter.’ Th eir eloquent warnings here in Oslo helped galvanize the world’s resolve to halt the nuclear arms race.” How large a nuclear release is required to precipitate a nuclear winter is still subject to technical debate, but with the **greatly improved models developed for climate science, recent estimates suggest as few as 50 Hiroshima-sized bombs** (15 kilotonnes each) would do it—or the use of **only one weapon in every 200** from the global nuclear arsenal (Robock 2009 ). Th is puts a very different complexion on the contemporary risks facing humanity. First, it suggests that **even a limited conflict among lesser actors in the arms race**, for example between Pakistan and India, India and China or Israel and Iran, and involving mainly the use of “battlefi eld” nukes **could still imperil the entire world.** In Lights Out: how it all ends , nuclear experts Alan Robock and Brian Toon examined the eff ects of a regional war (Robock and Toon 2012 ). To begin with, they argue, **a ‘limited nuclear war’ is highly unlikely** as, with the release of a handful of battlefi eld nukes, things will very quickly spiral out of control as communications fail and panic spreads, mushrooming into a more general conflict involving dozens of weapons spread over a much wider region. Firestorms in the megacities would throw up a shocking amount of smoke, ash and dust—around 70 billion tonnes is the estimate for an India/Pakistan clash. Running this through climate models they found it would block out sunlight, chilling the planet by an average 1.25° for up to 10 years—enough to cause crop-killing frosts , even in midsummer. Th is would sharply reduce and in some regions eliminate farm production for several years. Normal world grain stocks are suffi cient to feed humanity for only about 2–3 months, so one of the fi rst round eff ects of the war would be worldwide panic and fi nancial collapse as food supplies give out and grain prices soar astronomically. A billion people living on the margins of hunger would probably perish within weeks, and billions more over the ensuing months. In the early twenty-fi rst century at least eight nations, on this calculus, have the tools to terminate civilisation, and possibly **the human species**, on their own, while at least two more aspire to the power to do so. Meanwhile the shadow of possible nuclear and chemical terrorism, and their consequences, is lengthening.

**Trade**

**COVID vaccine debate will kill the WTO- there are no alternate causes and solvency is reverse causal**

**Meyer 6-18-21**

(David, Senior Writer, https://fortune.com/2021/06/18/wto-covid-vaccines-patents-waiver-south-africa-trips/)

The World Trade Organization **knows all about crises**. Former U.S. President Donald Trump threw a wrench into its core function of resolving trade disputes—a blocker that President Joe Biden has not yet removed—and there is widespread dissatisfaction over the **fairness of the global trade rulebook**. The 164-country organization, under the fresh leadership of Nigeria's Ngozi Okonjo-Iweala, has a lot to fix. However, **one crisis is more pressing than the others**: **the battle over COVID-19 vaccines**, and whether the protection of their patents and other intellectual property should be temporarily lifted to boost production and end the pandemic sooner rather than later. According to some of those pushing for the waiver—which was originally proposed last year by India and South Africa—**the WTO's future rests on what happens next.** "The credibility of the WTO will depend on its ability to find a meaningful outcome on this issue that truly ramps-up and diversifies production," says Xolelwa Mlumbi-Peter, South Africa's ambassador to the WTO. "Final nail in the coffin" The Geneva-based WTO isn't an organization with power, as such—it's a framework within which countries make big decisions about trade, generally by consensus. It's supposed to be the forum where disputes get settled, because all its members have signed up to the same rules. And one of its most important rulebooks is the Agreement on Trade-Related Aspects of Intellectual Property Rights, or TRIPS, which sprang to life alongside the WTO in 1995. The WTO's founding agreement allows for rules to be waived in exceptional circumstances, and indeed this has happened before: its members agreed in 2003 to waive TRIPS obligations that were blocking the importation of cheap, generic drugs into developing countries that lack manufacturing capacity. (That waiver was effectively made permanent in 2017.) Consensus is the key here. Although the failure to reach consensus on a waiver could be overcome with a 75% supermajority vote by the WTO's membership, this would be an **unprecedented and seismic event**. In the case of the COVID-19 vaccine IP waiver, it would mean standing up to the European Union, and Germany in particular, as well as countries such as Canada and the U.K.—the U.S. recently flipped from opposing the idea of a waiver to supporting it, as did France. It's a dispute between countries, but the result will be on the WTO as a whole, say waiver advocates. "If, in the face of one of humanity's greatest challenges in a century, the WTO functionally becomes an obstacle as in contrast to part of the solution, I think **it could be the final nail in the coffin**" for the organization, says Lori Wallach, the founder of Public Citizen's Global Trade Watch, a U.S. campaigning group that focuses on the WTO and trade agreements. "If the TRIPS waiver is successful, and people see the WTO as being **part of the solution**—saving lives and livelihoods—it could **create** **goodwill and momentum to address what are still daunting structural problems**." Those problems are legion. Reform needs Top of the list is the WTO's Appellate Body, which hears appeals in members' trade disputes. It's a pivotal part of the international trade system, but Trump—incensed at decisions taken against the U.S. —blocked appointments to its seven-strong panel as judges retired. The body became completely paralyzed at the end of 2019, when two judges' terms ended and the panel no longer had the three-judge quorum it needs to rule on appeals. Anyone who hoped the advent of the Biden administration would change matters was disappointed earlier this year when the U.S. rejected a European proposal to fill the vacancies. "The United States continues to have systemic concerns with the appellate body," it said. "As members know, the United States has raised and explained its systemic concerns for more than 16 years and across multiple U.S. administrations." At her confirmation hearing in February, current U.S. Trade Representative Katherine Tai reiterated those concerns—she said the appellate body had "overstepped its authority and erred in interpreting WTO agreements in a number of cases, to the detriment of the United States and other WTO members," and accused it of dragging its heels in settling disputes. "Reforms are needed to ensure that the underlying causes of such problems do not resurface," Tai said. "While the U.S. [has] been engaging [with the WTO] it hasn't indicated it would move quickly on allowing appointments to the Appellate Body," says Bryan Mercurio, an economic-law professor at the Chinese University of Hong Kong, who opposes the vaccine waiver. "This is not a good sign. In terms of WTO governance, it's a much more important step than supporting negotiations on an [intellectual property] waiver." It's not just the U.S. that wants to see reform at the WTO. In a major policy document published in February, the EU said negotiations had failed to modernize the organization's rules, the dispute-resolution system was broken, the monitoring of countries' trade policies was ineffective, and—crucially—"the trade relationship between the U.S. and China, two of the three largest WTO members, is currently largely managed outside WTO disciplines." China is one of the key problems here. It became a WTO member in 2001 but, although this entailed significant liberalization of the Chinese economy, it did not become a full market economy. As the European Commission put it in February: "The level at which China has opened its markets does not correspond to its weight in the global economy, and the state continues to exert a decisive influence on China's economic environment with consequent competitive distortions that cannot be sufficiently addressed by current WTO rules." "China is operating from what it sees as a position of strength, so it will not be bullied into agreeing to changes which it sees as not in its interests," says Mercurio. China is at loggerheads with the U.S., the EU and others over numerous trade-related issues. Its rivals don't like its policy of demanding that Chinese citizens' data is stored on Chinese soil, nor do they approve of how foreign investors often have to partner with Chinese firms to access the country's market, in a way that leads to the transfer of technological knowhow. They also oppose China's industrial subsidies. Mercurio thinks China may agree to reforms on some of these issues, particularly regarding subsidies, but "only if it is offered something in return." All these problems won't go away if the WTO manages to come up with a TRIPS waiver for COVID-19 vaccines and medical supplies, Wallach concedes. "But," she adds, "**the will and the good faith** to tackle these challenges is **increased enormously** if the WTO has the **experience of being part of the solution, not just an obstacle."** Wallach points to a statement released earlier this month by Asia Pacific Economic Cooperation (APEC) trade ministers, which called for urgent discussions on the waiver. "The WTO must **demonstrate that global trade rules can help address the human catastrophe** of the COVID-19 pandemic and facilitate the recovery," the statement read in its section about WTO reform. Okonjo-Iweala's role The WTO's new director general, whose route to the top was unblocked in early 2021 with the demise of the Trump administration, is certainly keen to fix the problems that contributed to the early departure of her predecessor, Brazil's Robert Azevedo. "We must act now to get all our ambassadors to the table to negotiate a text" on the issue of an IP waiver for COVID vaccines, Ngozi Okonjo-Iweala, director general of the World Trade Organization, has said. Dursun Aydemir—Anadolu/Bloomberg/Getty Images Earlier this week, when the U.S. and EU agreed a five-year ceasefire in a long-running dispute over Boeing and Airbus aircraft subsidies, Okonjo-Iweala tweeted: "With political will, we can solve even the most intractable problems." However, Mercurio is skeptical about her stewardship having much of an effect on the WTO's reform process. "Upon taking [over she] stated it was time for delegations to speak to each other and not simply past each other, but at the recent General Counsel meeting delegations simply read prepared statements in what some have described as the worst meeting ever," he says. "On the other hand, Ngozi is very much someone who will actively seek solutions to problems, and in this way different to her predecessor. If the role of mediator is welcomed, she could have an impact not in starting discussions but in getting deals over the finish line." A spokesperson for the WTO Secretariat declined to offer comment on Mlumbi-Peter and Wallach's suggestions that the organization's credibility rests on the vaccine patent waiver issue, but pointed to a May speech in which Okonjo-Iweala said the WTO could help tackle vaccine supply chain monitoring and transparency, helping manufacturers scale up production, and creating a more geographically diversified manufacturing base. In her speech, the WTO chief also said members "must address issues related to technology transfer, knowhow and intellectual property," including the waiver proposal. "We must act now to get all our ambassadors to the table to negotiate a text," she said.

**Unchecked protectionism spurred by COVID threatens free trade ­– WTO legitimacy is key**

**Solís 20** [Mireya Solís, Director - Center for East Asia Policy Studies Senior Fellow - Foreign Policy, Center for East Asia Policy Studies Philip Knight Chair in Japan Studies. "The post COVID-19 world: Economic nationalism triumphant?," Brookings, 7-10-2020, accessed 9-3-2021, https://www.brookings.edu/blog/order-from-chaos/2020/07/10/the-post-covid-19-world-economic-nationalism-triumphant/] HWIC

The damage caused by the worst global health crisis in a century is vast. The new coronavirus has traveled far and fast, infecting more than 8.7 million people and killing more than 460,000. One after another, economies have gone into lockdown to slow down the spread of the disease. The combined supply and demand shocks have ravaged the world economy with the most severe downturn since the Great Depression; anticipated drops to international trade and investment flows of 30% and 40%, respectively; and unemployment spikes in many countries. The pandemic has cost lives and livelihoods and has erased the chances of returning to the status quo ante, but it has also brought little clarity regarding what kind of international order it will usher in. Is the future one of deglobalization, decoupling, and reshoring of economic activity?

The pandemic hit an already wounded multilateral trading system. The chances that the World Trade Organization (WTO) can deliver a multilateral round of trade negotiations to slash tariffs across the board and update the trade and investment rulebook are nil. But the WTO has also lost its central role as arbiter of trade disputes among its members. In December 2019, the Appellate Body ceased to function due to the U.S. block of new appointments, citing judicial overreach. At a time of rising protectionism, the erosion of a rules-based mechanism to adjudicate disputes bodes ill.

Longstanding challenges to the WTO have been exacerbated by an abdication of leadership from the great powers to ensure its survival. China has been the godchild of globalization, leveraging its accession to the WTO to become workshop for the world and a huge domestic market coveted by foreign firms. But China lost its appetite for economic reform, reinvesting on a state capitalism model that imposes heavy costs on other nations. Unchecked subsidies and privileges awarded to its state-owned enterprises, insufficient protection of intellectual property, foreign investment restrictions, forced technology transfers, and cyber protectionism all make the Chinese government’s self-proclamation as champion of global free trade ring hollow.

The Trump administration judges the WTO incapable of tackling the China challenge, but instead of creating coalitions of like-minded countries to bring about effective multilateral trade governance, it appears determined to further cripple the international organization. It has offered no blueprint to fix the dispute settlement mechanism, has abused the national security exemption to raise tariffs against allies, and is gearing up for its most fundamental assault to date on the WTO: a tariff reset through which the U.S. may unilaterally abandon its commitments on bound tariffs and apply larger duties to force other countries to open their markets. Trade spats as other countries retaliate in kind is a more likely result.

Tariff wars and the battle for technology supremacy have come to define U.S.-China great power competition. After a grueling trade conflict, the United States and China reached a limited trade agreement in January 2020. The deal marked a pause in the tariff war and addressed some non-tariff barriers on foreign direct investment and intellectual property; but it left intact the core of Chinese industrial policy (public subsidies and state-owned  enterprises) and retained U.S. duties on $360 billion worth of Chinese products. China’s massive purchase commitments ($200 billion) were quickly rendered unattainable by the severe economic downturn in China due to COVID-19.

In fighting for the new economic order, setting standards on cutting-edge technologies will be at the forefront. China is using all the levers of industrial policy to gain technological primacy in areas like AI and quantum computing. Telecom and the battle over 5G offer a preview of quarrels to come. Deeply concerned with the cybersecurity risks that Chinese telecom giants like Huawei pose, the U.S. government placed the company on its Entity List, banning American exports without a license. It has since tightened the restrictions by barring foreign companies from supplying Huawei with products manufactured with American equipment and technology. National security concerns are increasingly encroaching on existing webs of economic interdependence. Wary of China’s acquisition of critical technology, countries like the United States, Australia, and Japan have tightened their screening of foreign direct investment. The pandemic has only exacerbated concerns that weakened companies in strategic sectors are at risk of foreign takeover.

COVID-19’s impact on the international trading system is twofold. It has reinforced existing trends such as the deceleration and now drop in the volume of international trade, the rise of economic security as governments expand their toolkit to restrict trade and investment flows, and it has laid bare the fallout in U.S.-China relations. But the pandemic also brought new challenges that exposed the extent to which trade cooperation is in short supply. Export protectionism has risen in prominence with national restrictions on shipments of essential medical supplies and personal protective equipment. The WTO allows for such curbs for public health purposes – provided the measures are temporary and transparent. Few countries, however, have bothered to comply with their notification commitments. The blow comes at a time when the WTO is adrift with the decision of Director General Roberto Azevedo to step down early, opening the search for new leadership in a climate of divisiveness.

Are we on the eve of a renationalized world economy? That is the aspiration of several American and European public officials who fault extended global supply chains and overdependence on China for the current mishaps in tackling the pandemic. But the view that economic nationalism and reshoring of manufacturing is a fail-safe path to security and prosperity is wrong. For one, it skirts the responsibility of governments to properly stockpile essential medical supplies. Furthermore, the export curbs will be counterproductive, eliminating incentives for producers to expand capacity and increasing the cost of much needed medicines and medical devices. If the recent lockdowns have taught us anything, it is that exclusive reliance on the domestic market is too risky. Diversification of supply, redundancies in the manufacturing chain, and stockpiling programs are better alternatives. In this endeavor, global supply chains are part of the solution, not the problem.

COVID-19 will not produce an exodus of foreign companies from the Chinese market. Recent surveys of American companies with operations in China show that most firms intend to stay put. A [February survey](https://www.reuters.com/article/us-health-coronavirus-china-business/most-u-s-firms-have-no-plans-to-leave-china-due-to-coronavirus-survey-idUSKBN21Z08K) of Japanese companies conducted by [Tokyo Shoko Research](https://www.tsr-net.co.jp/news/analysis/20200220_04.html) shows that only a fraction (4%) are considering exit from China. Therefore, the Japanese government’s $2.2 billion fund to restructure supply chains should be understood as risk management, not decoupling. When international companies map out their business strategies, they must factor in heightened risks – protectionism, national security controls, and economic lockdowns. Hence, efforts by middle powers to offer an interim arbitration mechanism at the WTO to handle trade disputes and to commit to maintaining open supply chains in essential medical goods are the right antidote to rising economic nationalism. As a staunch supporter of rules-based trade and with its decision to forego export protectionism in the current crisis, Japan has much to contribute to these efforts.

The requiem for globalization has been sung many times. Announcements of its demise in the COVID-19 era are likely to prove premature. But it will be a harder-edged globalization forged by the crucible of geopolitical risk and pandemic disruption.

**WTO Collapse kills economic interdependence and causes hostile blocs gutting benefits of trade/growth**

**Dadush 19**

(Uri Dadush is a Senior Fellow at the Policy Center for the New South in Rabat, Morocco and a non-resident scholar at Bruegel. <https://www.policycenter.ma/publications/seven-predictions-about-world-without-wto>, 4-23)

Now to the main task: imagining world trade without the WTO/GATT system – that is, world trade without an overarching set of rules. This scenario is today far from implausible. It was after all, the case through recorded history until around 1950. But today’s economies are far more globally integrated than in the past, and information technologies which facilitate communication and coordination are clearly pointing to even more integration in the future. Under a no-WTO scenario, I am lead to formulate seven predictions. First, the system will be based on a combination of power, bilateral deals, and (unenforceable) norms or practices from the days of the WTO. Without WTO disciplines, the balance of power within nations will shift from export interests to import-competing interests, probably entailing an **escalation of protectionist measures** across the world, adding to the recent problems (Global Trade Alert, 2019). To some degree this trend will be moderated by the fact that some 75% of world trade consists of raw materials (UNCTAD), parts and machinery which are needed for domestic and export production, but not in instances where import competing interests are powerful, as the case of steel producers in the United States has shown most recently. Second, trade-related power – as distinguished from military power - will be equally distributed among three major actors, namely the US, the European Union, and China (dadush and Wolff, 2019). To contain the uncertainty, the major trade powers will almost certainly try to strike bilateral deals with each other, as is already happening (negotiations are ongoing between the United States, China, the EU and Japan, for example). But such deals will not have the high ambitions of, say, the now discarded Trans-Atlantic Trade and Investment Partnership which attempted to deal with regulatory and other non-tariff barriers to trade. Instead, they will be largely defensive; they will aim to preserve as much as possible of the rules and disciplines presently enshrined in the WTO, which mainly relate to tariffs in manufactures and agriculture, while recreating a bilateral mechanism for dispute settlement. However, in practice, striking even a minimal US-EU, US-China or EU-China trade deal may prove impossible. In that case, there will be a sequence of continuous and unmanageable disputes that will make the business and trade environment of even the largest players far less predictable than it is today. Because so much trade takes the form of inputs, such as machinery, the effects of this uncertainty will be felt far beyond the sectors which are directly open to international competition. Third, faced with the choice of chaos or a trade deal, many smaller nations will be forced into vastly asymmetric deals with China, the EU and the US. The point is that smaller nations currently have a choice of reaching a trade deal or relying on WTO disciplines, which include Most Favored Nation Treatment, etc. When that alternative is no longer available, negotiations will become even more unbalanced in favour of the major trade powers. Fourth, the trading system will naturally then tend to splinter into three blocks around the three giants. With the US, EU and China holding different interests, traditions and views about the trade rules and disciplines that are most important to them, the likelihood of developing a common set of obligations to govern e-commerce, intellectual property protection, industrial and agricultural subsidies, carbon taxes, and investment will be **close to zero**. Insofar as the blocks turn hostile to each other, smaller nations may be forced to choose between these blocks on account not only of economic but security considerations as well. Fourth, the new non-system of bilateral deals and unilateral action, discrimination possibilities will be endless. There will be little to stop national security establishments from pressing to use trade policy against nations seen as a threat, and more lenient treatment of allies. Corporate interests will press for higher tariffs on nations most competitive in their sectors. Human rights and environmental activist will press for retaliation against nations they see, rightly or wrongly, as violators of their values. Bilateral deals will routinely include discrimination against third parties – examples of which can be seen in the more restrictive rules-of-origin, export restraints, managed trade, and geopolitically motivated exclusions sought most recently by US negotiators. Fifth, nations that are currently part of established trade agreements will fare much better than nations that are not, assuming that the agreements hold in the face of a protectionist wave. For example, individual EU nations currently can count on a combination of the Single Market and numerous EU partnership agreements such as that with Japan to cover about 75% of their trade. Developing nations such as Chile, Mexico, and Morocco, will be more sheltered from a trade storm than nations such as Brazil and India. But while trade agreements will protect nations from the direct effects of protectionism, they will still be affected by second round effects. For example, Mexico’s exports of auto parts to the United States will be penalized if the United States can no longer export BMWs manufactured in North Carolina to China. Sixth, all sectors will be hit, but sectors such as autos and electronics which rely on global value chains will suffer disproportionately as will sectors such as soybeans and corn which rely heavily on export markets and which can easily become the object of retaliation. Utilities, such as electricity generation, and services such as finance and health-care which are less affected by import competition and less dependent on exports will be less affected directly but will suffer indirectly as the purchasing power of consumers is squeezed by higher prices and the price of imported machinery and raw materials increases. In short, world trade without the WTO would be a very bad outcome for the world economy as a whole, even if the effect will be disparate across countries and sectors. Things could get worse still when the business cycle deteriorates, leading to the seventh prediction. When the next international financial crisis hits = as it has infrequently but with distressing regularity over the centuries -- **the trade picture is far more likely to resemble the protectionism and competitive currency devaluation of the 1930’s than the restraint shown in 2008-2009**. Undoubtedly, such a scenario would contribute to a downward spiral that may result in **profound depression and mass unemployment.**

**The WTO is crucial to make global trade equitable and reduce poverty**

**Narlikar, PhD, 18**

(AMRITA NARLIKAR is President of the GIGA German Institute of Global and Area Studies and a professor at the University of Hamburg. <https://www.foreignaffairs.com/articles/2018-03-05/trade-war-poor>, 3-5)

Recurrent deadlocks have plagued the Doha negotiations since their launch in 2001, damaging the credibility of the organization that oversees this unfortunate negotiation process. The WTO’s Ministerial Conference in Nairobi in 2015, which coincided with the 20th anniversary of the WTO’s founding, should have been a moment for celebration. Instead, it turned out to be an embarrassment: for the first time the Ministerial Declaration reflected not consensus but fundamental division over whether even to reaffirm the Doha mandates, which had sought to launch an ambitious round of multilateral trade liberalization with a close eye on development issues. At its Ministerial Conference in Buenos Aires, in 2017, the WTO sank to a new low: this conference was unprecedented in its failure to even produce a Ministerial Declaration. The WTO seems to be whimpering its way to an inglorious end. And if the global trading mechanism does indeed collapse, the consequences **will be adverse for all parties, but especially so for the poorest of the world**. PUNISHING DEVELOPING COUNTRIES AND THE POOREST PEOPLE In 2010, the Millennium Development Goals reached one of its targets, of cutting extreme poverty by half. The most important factor that contributed to this achievement was economic growth in many developing countries, especially China and India. Although such growth was fueled by several factors, **one critical driver was international trade**. **Extensive research** shows that the countries and regions that harnessed the opportunities afforded by low tariffs and open markets did particularly well, aided as they were by a reliable system of enforceable trade rules—all negotiated, monitored, and implemented under the auspices of **the WTO**. Still, between 600 million and 700 million people currently live under $1.90 per day and are concentrated in middle-income and lower-income developing countries. For instance, 4.5 percent of Brazilians live below the extreme poverty line, six percent do in India, and 34 and 42 percent do in Afghanistan and Nigeria. Much work still has to be done to address the concerns of the poor worldwide, and a minimal step toward this would be to ensure continued market access for developing countries and to maintain the predictability of tariff and non-tariff barriers. **If the WTO collapses**, rich countries would easily be able to crank up tariffs against poorer countries, while introducing many other protectionist measures to discourage imports. Developing countries, which have experienced growth through exports, and have adapted their production chains to export markets, would be hit hard. A decline in their exports would directly affect their producers and workers in the affected industries, resulting in losses for poor people who can least afford such losses. The costs, moreover, would go beyond the immediate job losses and price hikes in basic goods. The first fundamental benefit that poor countries derive from the WTO is that they get a relatively level playing field for negotiating with more powerful countries. Outside the WTO, in bilateral and regional settings**, it is much easier to coerce countries into accepting harsh terms** in a trade deal, such as through stringent environmental and labor standards that they would find virtually impossible to meet. In contrast, the institutional setting of the WTO offers developing countries some **indispensable advantages**. Formally, all members in the WTO have one vote each (very different from voting procedures at the UN Security Council and the International Monetary Fund). This is **a powerful equalization tool**, which is rendered all the more potent by the fact that consensus-based decision-making allows even the smallest and weakest player de jure veto power. Informally, having an audience within the institution, and a range of partners to work with, enables poor countries to **form coalitions** with like-minded states. Some powerful coalitions have emerged over the years, which have allowed poor and middle-income countries to band together (sometimes also with developed countries) to punch considerably above their weight in the Doha negotiations. One example is the G-33. It began as a coalition of 33 developing countries including China, India, Indonesia, Nigeria, Pakistan, and others, but now comprises 47 members and has managed to resist calls for greater market opening for agricultural products in developing economies. The G-20, a coalition led by Brazil, China, and India at the time of its founding, which now includes 23 developing countries, has demanded more ambitious market opening for agricultural products in developed country markets. Without the WTO, developing countries would have neither the institutional rules to protect them nor the support of coalitions to enhance their **bargaining power.** The second important benefit that developing countries derive from the WTO is its Dispute Settlement Mechanism (DSM), which allows members to take another member “to court” over violating trade rules. In the event a judgment is made, the WTO can then authorize retaliatory measures against the responding party. Even though there are several deterrents that might make poor countries reluctant to make use of this facility (including the fact that bringing a dispute against a rich country requires extensive technical and legal know-how, and low-income countries sometimes lack the resources and capacity to initiate a case), the figures show considerable learning and growing effectiveness on their part. While the United States and the European Union have been the most avid users of the DSM (they have brought 115 and 97 cases, respectively, since 1995), many large developing countries have also frequently lodged complaints. China, for example, has brought 15 cases; India, 23; and Brazil, 31. Nor should one assume that the DSM has been the stomping ground of only developed countries and rising powers. David has sometimes taken on Goliath. Ecuador, for example, filed a complaint against U.S. action against its shrimp exports in 2005, and won, despite the extreme asymmetry of power. Allow the WTO to wither away and the **world returns to a system of unchecked power politics**. The costs, moreover, would not necessarily be limited to the “global South” and its poorest people. FROM WIN-WIN TO LOSE-LOSE Even if a WTO collapse would strike the poorest nations the hardest, rich countries will not escape its impact, as the resulting protectionism would greatly hurt poor consumers in developed economies. They would lose access to cheap and competitive imports from developing countries, including essential items such as fruits and vegetables, garments, footwear, and other items on which the average person spends a large proportion of his or her disposable income. The impact of increased tariffs on employment, however, would be, at best, mixed. Any gains would be restricted to specific sectors. For instance, a tariff increase on steel imports may see job increases in that particular industry—although tariffs would not save the job losses that have occurred due to technological innovation—but many other U.S. industries that rely on steel imports, such as producers of cars or electrical machinery, would see their production costs rise. This, in turn, would negatively affect their domestic and international competitiveness, profit margins, and their ability to hire and pay wages. Further, it is unlikely that other countries will accept such treatment sitting down. Retaliatory action could potentially go considerably beyond the steel and steel-consuming sector. China is the second-largest market for agricultural exports from the United States; if China increased trade barriers against soybeans, coarse grains, meat products, and cotton, it could hurt U.S. jobs across several sectors. Of course, such measures by China would be welfare-reducing for its own consumers too, who benefit from these key and competitive U.S. imports. Almost all parties would thus end up in an entirely unnecessary and sad lose-lose situation. In sum, a trade war would be a lose-lose for all, but particularly the poorest in developed and rising powers.

**Solvency**

**Plan: Member nations of the World Trade Organization ought to reduce intellectual property protections for medicines for COVID-19.**

**WTO Communication 20**

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(Communication from India and South Africa to the WTO Council for Trade-Related Aspects of Intellectual Property Rights. "WAIVER FROM CERTAIN PROVISIONS OF THE TRIPS AGREEMENT FOR THE PREVENTION, CONTAINMENT AND TREATMENT OF COVID-19." 10-02-2020, https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669.pdf&amp;Open=True)

9. There are several reports about intellectual property rights hindering or potentially hindering timely provisioning of affordable medical products to the patients.3 It is also reported that some WTO Members have carried out urgent legal amendments to their national patent laws to expedite the process of issuing compulsory/government use licenses. 10. Beyond patents, other intellectual property rights may also pose a barrier, with limited options to overcome those barriers. In addition, many countries especially developing countries may face institutional and legal difficulties when using flexibilities available in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement). A particular concern for countries with insufficient or no manufacturing capacity are the requirements of Article 31bis and consequently the cumbersome and lengthy process for the import and export of pharmaceutical products. 11. Internationally, there is an urgent call for global solidarity, and the unhindered global sharing of technology and know-how in order that rapid responses for the handling of COVID-19 can be put in place on a real time basis. 12. In these exceptional circumstances, **we request that the Council for TRIPS recommends, as early as possible, to the General Council a waiver from the implementation, application and enforcement of Sections 1, 4, 5, and 7 of Part II of the TRIPS Agreement in relation to prevention, containment or treatment of COVID-19. 13. The waiver should continue until widespread vaccination is in place globally, and the majority of the world's population has developed immunity hence we propose an initial duration of [x] years from the date of the adoption of the waiver.** 14. We request that the Council for TRIPS urgently recommends to the General Council adoption of the annexed decision text.

**The plan creates a new goldilocks patent law that exempts pandemics**

**Lindsey, JD Harvard, 21**

(Brink, <https://www.brookings.edu/blog/up-front/2021/06/03/why-intellectual-property-and-pandemics-dont-mix/>, 6-3)

Waiving patent protections is certainly no panacea. What is needed most urgently is a massive drive of technology transfer, capacity expansion, and supply line coordination to bring vaccine supply in line with global demand. Dispensing with patents in no way obviates the need for governments to fund and oversee this effort. Although focusing on these immediate constraints is vital, we cannot confine our attention to the short term. First of all, the COVID-19 pandemic is far from over. Although Americans can now see the light at the end of the tunnel thanks to the rapid rollout of vaccines, most of the world isn’t so lucky. The virus is currently raging in India and throughout South America, overwhelming health care systems and inflicting suffering and loss on a horrific scale. And consider the fact that Australia, which has been successful in suppressing the virus, recently announced it was sticking to plans to keep its borders closed until mid-2022. Criticisms of the TRIPS waiver that focus only on the next few months are therefore short-sighted: this pandemic could well drag on long enough for elimination of patent restrictions **to enable new vaccine producers to make a positive difference.** Furthermore, and probably even more important, this is almost certainly not the last pandemic we will face. Urbanization, the spread of factory-farming methods, and globalization all combine to increase the odds that a new virus will make the jump from animals to humans and then spread rapidly around the world. Prior to the current pandemic, the 21st century already saw outbreaks of SARS, H1N1, MERS, and Ebola. Everything we do and learn in the current crisis should be viewed from the perspective of getting **ready for next time.** THE NATURE OF THE PATENT BARGAIN When we take the longer view, we can see a fundamental mismatch between the policy design of intellectual property protection and the policy requirements of **effective pandemic response.** Although patent law, properly restrained, constitutes one important element of a well-designed national innovation system, the way it goes about encouraging technological progress is **singularly ill-suited** to the emergency conditions of a pandemic or other public health crisis. Securing a TRIPS waiver for COVID-19 vaccines and treatments would thus **establish a salutary precedent** that, in emergencies of this kind, governments should employ other, **more direct means to incentivize** the development of new drugs. Here is the basic bargain offered by patent law: encourage the creation of useful new ideas for the long run by slowing the diffusion of useful new ideas in the short run. The second half of the bargain, the half that imposes costs on society, comes from the temporary exclusive rights, or monopoly privileges, that a patent holder enjoys. Under U.S. patent law, for a period of 20 years nobody else can manufacture or sell the patented product without the permission of the patent holder. This allows the patent holder to block competitors from the market, or extract licensing fees before allowing them to enter, and consequently charge above-market prices to its customers. Patent rights thus slow the diffusion of a new invention by restricting output and raising prices. The imposition of these short-run costs, however, can bring net long-term benefits by sharpening the incentives to invent new products. In the absence of patent protection, the prospect of easy imitation by later market entrants can deter would-be innovators from incurring the up-front fixed costs of research and development. But with a guaranteed period of market exclusivity, inventors can proceed with greater confidence that they will be able to recoup their investment. For the tradeoff between costs and benefits to come out positive on net, patent law must strike the right balance. Exclusive rights should be valuable enough to encourage greater innovation, but not so easily granted or extensive in scope or term that this encouragement is outweighed by output restrictions on the patented product and discouragement of downstream innovations dependent on access to the patented technology. Unfortunately, the U.S. patent system at **present is out of balance.** Over the past few decades, the expansion of patentability to include software and business methods as well as a general relaxation of patenting requirements have led to wildly excessive growth in these temporary monopolies: the number of patents granted annually has skyrocketed roughly fivefold since the early 1980s. One unfortunate result has been the rise of “non-practicing entities,” better known as patent trolls: firms that make nothing themselves but buy up patent portfolios and monetize them through aggressive litigation. As a result, a law that is supposed to encourage innovation has turned into a legal minefield for many would-be innovators. In the pharmaceutical industry, firms have abused the law by piling up patents for trivial, therapeutically irrelevant “innovations” that allow them to extend their monopolies and keep raising prices long beyond the statutorily contemplated 20 years. Patent law is creating these unintended consequences because policymakers have been caught in an ideological fog that conflates “intellectual property” with actual property rights over physical objects. Enveloped in that fog, they regard any attempts to put limits on patent monopolies as attacks on private property and view ongoing expansions of patent privileges as necessary to **keep innovation from grinding to a halt.** In fact, patent law is a tool of regulatory policy with the usual tradeoffs between costs and benefits; like all tools, it can be misused, and as with all tools there are some jobs for which other tools are better suited. A well-designed patent system, in which benefits are maximized and costs kept to a minimum, is just one of various policy options that governments can employ to stimulate technological advance—including tax credits for R&D, prizes for targeted inventions, and direct government support. PUBLIC HEALTH EMERGENCIES AND DIRECT GOVERNMENT SUPPORT For pandemics and other public health emergencies, **patents’ mix of costs and benefits is misaligned with what is needed for an effective policy response**. The basic patent bargain, even when well struck, is to pay for more innovation down the road with slower diffusion of innovation today. In the context of a pandemic, that bargain is a **bad one and should be rejected entirely**. Here the imperative is to accelerate the diffusion of vaccines and other treatments, not slow it down. Giving drug companies the power to hold things up by blocking competitors and raising prices pushes in the completely wrong direction.

**Removing IP protections will increase production, diversify supply, and spur innovations that protect against future pandemics**

**Human Rights Watch 6-3**-21 https://www.hrw.org/news/2021/06/03/seven-reasons-eu-wrong-oppose-trips-waiver#

Intellectual property is currently a barrier to swiftly scaling up and diversifying the production of Covid-19 health products, including vaccines. The European Commission claims that intellectual property (IP) is not a barrier to scaling up the manufacturing of vaccines or other health products needed for the Covid-19 response, suggesting that sharing IP would not immediately speed up manufacturing. Right now, there are manufacturers with capacity to produce additional Covid-19 vaccines and other health products at factories in Bangladesh, Canada, Denmark, India, and Israel, but they are unable to contribute because they do not yet have the right licenses. So, IP is a barrier to them. The TRIPS waiver proposal sponsors and experts at the leading science journal Nature, Médecins Sans Frontières (MSF) Access Campaign, the Third World Network, and others have presented many other concrete examples of how enforcement of IP rules blocked, delayed, or limited production of chemical reagents for Covid-19 tests, ventilator valves, Covid-19 treatments, and elements of Covid-19 vaccines. IP constraints have not only led to vaccine shortages but have also led to shortages of key raw materials like bioreactor bags and filters. Rather than manufacturers being held back by an inherent lack of manufacturing and technological capability, studies have shown that transnational claims to IP impede new manufacturers from entering and competing in the market. The same dynamics are playing out today with Covid-19. Even though a waiver will not automatically expand production overnight, it paves the way for **speedy technology transfers and manufacturing.** The waiver by itself will not automatically result in widespread and diversified manufacturing, but it will ease complex global rules governing IP and exports and give governments freedom to collaborate on technology transfers and exports without fearing trade-based retaliation. It will help reduce the dependence on any one country or region for medical products and mitigate the risks of export restrictions. With new variants emerging and some evidence that repeat vaccine boosters may be needed, the waiver will enable governments around the world to be prepared for **a long-term response** to Covid-19. Experts have mapped out plans for how the manufacturing of mRNA and other vaccines, could be dramatically expanded in a relatively short period of time. Waiving certain IP rules in the TRIPS agreement over the next three years could help create diverse regional manufacturing hubs and protect the EU and the rest of the world **from future pandemics**, supply chain disruptions, and **resulting economic disaster.** Concerns that widening the universe of producers may lower or compromise quality standards are unfounded because stringent regulatory authorities and the World Health Organization (WHO) would continue to play their existing role as arbiters of quality and safety for vaccines, which have a very stringent process for approval.

**FW**

**The standard is maximizing expected well-being – to clarify, hedonistic act util. Prefer –**

**1] Pleasure and pain *are* intrinsic value and disvalue – everything else *regresses* – robust neuroscience.**

**Blum et al. 18**

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**Pleasure** is not only one of the three primary reward functions but it also **defines reward.** As homeostasis explains the functions of only a limited number of rewards, the principal reason why particular stimuli, objects, events, situations, and activities are rewarding may be due to pleasure. This applies first of all to sex and to the primary homeostatic rewards of food and liquid and extends to money, taste, beauty, social encounters and nonmaterial, internally set, and intrinsic rewards. Pleasure, as the primary effect of rewards, drives the prime reward functions of learning, approach behavior, and decision making and provides the **basis for hedonic theories** of reward function. We are attracted by most rewards and exert intense efforts to obtain them, just because they are enjoyable [10].

Pleasure is a passive reaction that derives from the experience or prediction of reward and may lead to a long-lasting state of happiness. The word happiness is difficult to define. In fact, just obtaining physical pleasure may not be enough. One key to happiness involves a network of good friends. However, it is not obvious how the higher forms of satisfaction and pleasure are related to an ice cream cone, or to your team winning a sporting event. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure [14].

Pleasure as a hallmark of reward is sufficient for defining a reward, but it may not be necessary. A reward may generate positive learning and approach behavior simply because it contains substances that are essential for body function. When we are hungry, we may eat bad and unpleasant meals. A monkey who receives hundreds of small drops of water every morning in the laboratory is unlikely to feel a rush of pleasure every time it gets the 0.1 ml. Nevertheless, with these precautions in mind, we may define any stimulus, object, event, activity, or situation that has the potential to produce pleasure as a reward. In the context of reward deficiency or for disorders of addiction, homeostasis pursues pharmacological treatments: drugs to treat drug addiction, obesity, and other compulsive behaviors. The theory of allostasis suggests broader approaches - such as re-expanding the range of possible pleasures and providing opportunities to expend effort in their pursuit. [15]. It is noteworthy, the first animal studies eliciting approach behavior by electrical brain stimulation interpreted their findings as a discovery of the brain’s pleasure centers [16] which were later partly associated with midbrain dopamine neurons [17–19] despite the notorious difficulties of identifying emotions in animals.

Evolutionary theories of pleasure: The love connection BO:D

Charles Darwin and other biological scientists that have examined the biological evolution and its basic principles found various mechanisms that steer behavior and biological development. Besides their theory on natural selection, it was particularly the sexual selection process that gained significance in the latter context over the last century, especially when it comes to the question of what makes us “what we are,” i.e., human. However, the capacity to sexually select and evolve is not at all a human accomplishment alone or a sign of our uniqueness; yet, we humans, as it seems, are ingenious in fooling ourselves and others–when we are in love or desperately search for it.

It is well established that modern biological theory conjectures that **organisms are** the **result of evolutionary competition.** In fact, Richard Dawkins stresses gene survival and propagation as the basic mechanism of life [20]. Only genes that lead to the fittest phenotype will make it. It is noteworthy that the phenotype is selected based on behavior that maximizes gene propagation. To do so, the phenotype must survive and generate offspring, and be better at it than its competitors. Thus, the ultimate, distal function of rewards is to increase evolutionary fitness by ensuring the survival of the organism and reproduction. It is agreed that learning, approach, economic decisions, and positive emotions are the proximal functions through which phenotypes obtain other necessary nutrients for survival, mating, and care for offspring.

Behavioral reward functions have evolved to help individuals to survive and propagate their genes. Apparently, people need to live well and long enough to reproduce. Most would agree that homo-sapiens do so by ingesting the substances that make their bodies function properly. For this reason, foods and drinks are rewards. Additional rewards, including those used for economic exchanges, ensure sufficient palatable food and drink supply. Mating and gene propagation is supported by powerful sexual attraction. Additional properties, like body form, augment the chance to mate and nourish and defend offspring and are therefore also rewards. Care for offspring until they can reproduce themselves helps gene propagation and is rewarding; otherwise, many believe mating is useless. According to David E Comings, as any small edge will ultimately result in evolutionary advantage [21], additional reward mechanisms like novelty seeking and exploration widen the spectrum of available rewards and thus enhance the chance for survival, reproduction, and ultimate gene propagation. These functions may help us to obtain the benefits of distant rewards that are determined by our own interests and not immediately available in the environment. Thus the distal reward function in gene propagation and evolutionary fitness defines the proximal reward functions that we see in everyday behavior. That is why foods, drinks, mates, and offspring are rewarding.

There have been theories linking pleasure as a required component of health benefits salutogenesis, (salugenesis). In essence, under these terms, pleasure is described as a state or feeling of happiness and satisfaction resulting from an experience that one enjoys. Regarding pleasure, it is a double-edged sword, on the one hand, it promotes positive feelings (like mindfulness) and even better cognition, possibly through the release of dopamine [22]. But on the other hand, pleasure simultaneously encourages addiction and other negative behaviors, i.e., motivational toxicity. It is a complex neurobiological phenomenon, relying on reward circuitry or limbic activity. It is important to realize that through the “Brain Reward Cascade” (BRC) endorphin and endogenous morphinergic mechanisms may play a role [23]. While natural rewards are essential for survival and appetitive motivation leading to beneficial biological behaviors like eating, sex, and reproduction, crucial social interactions seem to further facilitate the positive effects exerted by pleasurable experiences. Indeed, experimentation with addictive drugs is capable of directly acting on reward pathways and causing deterioration of these systems promoting hypodopaminergia [24]. Most would agree that pleasurable activities can stimulate personal growth and may help to induce healthy behavioral changes, including stress management [25]. The work of Esch and Stefano [26] concerning the link between compassion and love implicate the brain reward system, and pleasure induction suggests that social contact in general, i.e., love, attachment, and compassion, can be highly effective in stress reduction, survival, and overall health.

Understanding the role of neurotransmission and pleasurable states both positive and negative have been adequately studied over many decades [26–37], but comparative anatomical and neurobiological function between animals and homo sapiens appear to be required and seem to be in an infancy stage.

Finding happiness is different between apes and humans

As stated earlier in this expert opinion one key to happiness involves a network of good friends [38]. However, it is not entirely clear exactly how the higher forms of satisfaction and pleasure are related to a sugar rush, winning a sports event or even sky diving, all of which augment dopamine release at the reward brain site. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure.

Remarkably, there are pathways for ordinary liking and pleasure, which are limited in scope as described above in this commentary. However, there are **many brain regions**, often termed hot and cold spots, that significantly **modulate** (increase or decrease) our **pleasure or** even produce **the opposite** of pleasure— that is disgust and fear [39]. One specific region of the nucleus accumbens is organized like a computer keyboard, with particular stimulus triggers in rows— producing an increase and decrease of pleasure and disgust. Moreover, the cortex has unique roles in the cognitive evaluation of our feelings of pleasure [40]. Importantly, the interplay of these multiple triggers and the higher brain centers in the prefrontal cortex are very intricate and are just being uncovered.

Desire and reward centers

It is surprising that many different sources of pleasure activate the same circuits between the mesocorticolimbic regions (Figure 1). Reward and desire are two aspects pleasure induction and have a very widespread, large circuit. Some part of this circuit distinguishes between desire and dread. The so-called pleasure circuitry called “REWARD” involves a well-known dopamine pathway in the mesolimbic system that can influence both pleasure and motivation.

In simplest terms, the well-established mesolimbic system is a dopamine circuit for reward. It starts in the ventral tegmental area (VTA) of the midbrain and travels to the nucleus accumbens (Figure 2). It is the cornerstone target to all addictions. The VTA is encompassed with neurons using glutamate, GABA, and dopamine. The nucleus accumbens (NAc) is located within the ventral striatum and is divided into two sub-regions—the motor and limbic regions associated with its core and shell, respectively. The NAc has spiny neurons that receive dopamine from the VTA and glutamate (a dopamine driver) from the hippocampus, amygdala and medial prefrontal cortex. Subsequently, the NAc projects GABA signals to an area termed the ventral pallidum (VP). The region is a relay station in the limbic loop of the basal ganglia, critical for motivation, behavior, emotions and the “Feel Good” response. This defined system of the brain is involved in all addictions –substance, and non –substance related. In 1995, our laboratory coined the term “Reward Deficiency Syndrome” (RDS) to describe genetic and epigenetic induced hypodopaminergia in the “Brain Reward Cascade” that contribute to addiction and compulsive behaviors [3,6,41].

Furthermore, ordinary “liking” of something, or pure pleasure, is represented by small regions mainly in the limbic system

(old reptilian part of the brain). These may be part of larger neural circuits. In Latin, hedus is the term for “sweet”; and in Greek, hodone is the term for “pleasure.” Thus, the word Hedonic is now referring to various subcomponents of pleasure: some associated with purely sensory and others with more complex emotions involving morals, aesthetics, and social interactions. The capacity to have pleasure is part of being healthy and may even extend life, especially if linked to optimism as a dopaminergic response [42].

Psychiatric illness often includes symptoms of an abnormal inability to experience pleasure, referred to as anhedonia. A negative feeling state is called dysphoria, which can consist of many emotions such as pain, depression, anxiety, fear, and disgust. Previously many scientists used animal research to uncover the complex mechanisms of pleasure, liking, motivation and even emotions like panic and fear, as discussed above [43]. However, as a significant amount of related research about the specific brain regions of pleasure/reward circuitry has been derived from invasive studies of animals, these cannot be directly compared with subjective states experienced by humans.

In an attempt to resolve the controversy regarding the causal contributions of mesolimbic dopamine systems to reward, we have previously evaluated the three-main competing explanatory categories: “liking,” “learning,” and “wanting” [3]. That is, dopamine may mediate (a) liking: the hedonic impact of reward, (b) learning: learned predictions about rewarding effects, or (c) wanting: the pursuit of rewards by attributing incentive salience to reward-related stimuli [44]. We have evaluated these hypotheses, especially as they relate to the RDS, and we find that the incentive salience or “wanting” hypothesis of dopaminergic functioning is supported by a majority of the scientific evidence. Various neuroimaging studies have shown that anticipated behaviors such as sex and gaming, delicious foods and drugs of abuse all affect brain regions associated with reward networks, and may not be unidirectional. Drugs of abuse enhance dopamine signaling which sensitizes mesolimbic brain mechanisms that apparently evolved explicitly to attribute incentive salience to various rewards [45].

Addictive substances are voluntarily self-administered, and they enhance (directly or indirectly) dopaminergic synaptic function in the NAc. This activation of the brain reward networks (producing the ecstatic “high” that users seek). Although these circuits were initially thought to encode a set point of hedonic tone, it is now being considered to be far more complicated in function, also encoding attention, reward expectancy, disconfirmation of reward expectancy, and incentive motivation [46]. The argument about addiction as a disease may be confused with a predisposition to substance and nonsubstance rewards relative to the extreme effect of drugs of abuse on brain neurochemistry. The former sets up an individual to be at high risk through both genetic polymorphisms in reward genes as well as harmful epigenetic insult. Some Psychologists, even with all the data, still infer that addiction is not a disease [47]. Elevated stress levels, together with polymorphisms (genetic variations) of various dopaminergic genes and the genes related to other neurotransmitters (and their genetic variants), and may have an additive effect on vulnerability to various addictions [48]. In this regard, Vanyukov, et al. [48] suggested based on review that whereas the gateway hypothesis does not specify mechanistic connections between “stages,” and does not extend to the risks for addictions the concept of common liability to addictions may be more parsimonious. The latter theory is grounded in genetic theory and supported by data identifying common sources of variation in the risk for specific addictions (e.g., RDS). This commonality has identifiable neurobiological substrate and plausible evolutionary explanations.

Over many years the controversy of dopamine involvement in especially “pleasure” has led to confusion concerning separating motivation from actual pleasure (wanting versus liking) [49]. We take the position that animal studies cannot provide real clinical information as described by self-reports in humans. As mentioned earlier and in the abstract, on November 23rd, 2017, evidence for our concerns was discovered [50]

In essence, although nonhuman primate brains are similar to our own, the disparity between other primates and those of human cognitive abilities tells us that surface similarity is not the whole story. Sousa et al. [50] small case found various differentially expressed genes, to associate with pleasure related systems. Furthermore, the dopaminergic interneurons located in the human neocortex were absent from the neocortex of nonhuman African apes. Such differences in neuronal transcriptional programs may underlie a variety of neurodevelopmental disorders.

In simpler terms, the system controls the production of dopamine, a chemical messenger that plays a significant role in pleasure and rewards. The senior author, Dr. Nenad Sestan from Yale, stated: “Humans have evolved a dopamine system that is different than the one in chimpanzees.” This may explain why the behavior of humans is so unique from that of non-human primates, even though our brains are so surprisingly similar, Sestan said: “It might also shed light on why people are vulnerable to mental disorders such as autism (possibly even addiction).” Remarkably, this research finding emerged from an extensive, multicenter collaboration to compare the brains across several species. These researchers examined 247 specimens of neural tissue from six humans, five chimpanzees, and five macaque monkeys. Moreover, these investigators analyzed which genes were turned on or off in 16 regions of the brain. While the differences among species were subtle, **there was** a **remarkable contrast in** the **neocortices**, specifically in an area of the brain that is much more developed in humans than in chimpanzees. In fact, these researchers found that a gene called tyrosine hydroxylase (TH) for the enzyme, responsible for the production of dopamine, was expressed in the neocortex of humans, but not chimpanzees. As discussed earlier, dopamine is best known for its essential role within the brain’s reward system; the very system that responds to everything from sex, to gambling, to food, and to addictive drugs. However, dopamine also assists in regulating emotional responses, memory, and movement. Notably, abnormal dopamine levels have been linked to disorders including Parkinson’s, schizophrenia and spectrum disorders such as autism and addiction or RDS.

Nora Volkow, the director of NIDA, pointed out that one alluring possibility is that the neurotransmitter dopamine plays a substantial role in humans’ ability to pursue various rewards that are perhaps months or even years away in the future. This same idea has been suggested by Dr. Robert Sapolsky, a professor of biology and neurology at Stanford University. Dr. Sapolsky cited evidence that dopamine levels rise dramatically in humans when we anticipate potential rewards that are uncertain and even far off in our futures, such as retirement or even the possible alterlife. This may explain what often motivates people to work for things that have no apparent short-term benefit [51]. In similar work, Volkow and Bale [52] proposed a model in which dopamine can favor NOW processes through phasic signaling in reward circuits or LATER processes through tonic signaling in control circuits. Specifically, they suggest that through its modulation of the orbitofrontal cortex, which processes salience attribution, dopamine also enables shilting from NOW to LATER, while its modulation of the insula, which processes interoceptive information, influences the probability of selecting NOW versus LATER actions based on an individual’s physiological state. This hypothesis further supports the concept that disruptions along these circuits contribute to diverse pathologies, including obesity and addiction or RDS.