**1AC**

**1AC – Advocacy**

**Because the obligation to ensure the greatest expected wellbeing for the great number requires expanding access to medicine, I affirm the resolution: The member nations of the World Trade Organization ought to reduce intellectual property protections for medicines.**

**The World Trade Organization defines intellectual property as:**

[World Trade Organization, No Listed Publication Date. https://www.wto.org/english/tratop\_e/trips\_e/intel1\_e.htm]

**Intellectual property** rights are customarily divided into **two main areas**:

(i) Copyright and rights related to copyright.

The rights of **authors** of literary and artistic works (such as **books** and other writings, musical compositions, **paintings**, sculpture, computer programs and films) are protected by copyright, for a minimum period of **50 years** after the death of the author.

Also protected through copyright and related (sometimes referred to as “neighbouring”) rights are the rights of performers (e.g. actors, singers and musicians), producers of phonograms (sound recordings) and broadcasting organizations. The main social purpose of protection of copyright and related rights is to **encourage** and **reward creative work**.

(ii) Industrial property.

Industrial property can usefully be divided into two main areas:

One area can be characterized as the protection of distinctive signs, in particular **trademarks** (which distinguish the goods or services of one undertaking from those of other undertakings) and geographical indications (which identify a good as originating in a place where a given characteristic of the good is essentially attributable to its geographical origin).

The protection of such distinctive signs aims to stimulate and ensure **fair competition** and to protect consumers, by enabling them to make informed choices between various goods and services. The protection may last indefinitely, provided the sign in question continues to be distinctive.

Other types of industrial property are protected primarily to stimulate innovation, design and the creation of technology. In this category fall inventions (protected by patents), industrial designs and trade secrets.

The social purpose is to provide **protection** for the results of investment in the development of new technology, thus giving the incentive and means to **finance research** and **development activities**.

A functioning intellectual property regime should also facilitate the transfer of technology in the form of foreign direct investment, joint ventures and licensing.

The protection is usually given for a finite term (typically 20 years in the case of patents).

While the basic social objectives of intellectual property protection are as outlined above, it should also be noted that the exclusive rights given are generally subject to a number of **limitations** and **exceptions**, aimed at **fine-tuning the balance** that has to be found between the legitimate interests of right holders and of users.

**1AC – Pandemic Response**

**The intellectual property system is fundamentally mismatched with emergency pandemic conditions – creating a broad precedent that weakens restrictions on generic vaccines in response to pandemics not only stops immense suffering from COVID surges in India and South America – it also lays the groundwork for future pandemics that are inevitable. Ensuring we are ready for next time is vital**

**Lindsey 21** [Brink Lindsey has written on a wide range of topics including trade policy, globalization, American social and cultural history, and the nature of human capital. His current research focuses on economic growth and the policy barriers that impede it. "Why intellectual property and pandemics don’t mix." https://www.brookings.edu/blog/up-front/2021/06/03/why-intellectual-property-and-pandemics-dont-mix/]

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.

**This is particularly true in the United States – our Covid response was slow as mismanaged – ensuring we are ready next time is key to saving hundreds of thousands of lives the next time around**

**Lewis 21,** Tanya Lewis, 3-11-2021, "How the U.S. Pandemic Response Went Wrong—and What Went Right—during a Year of COVID," Scientific American, https://www.scientificamerican.com/article/how-the-u-s-pandemic-response-went-wrong-and-what-went-right-during-a-year-of-covid/

When the World Health Organization first called COVID-19 a pandemic on March 11, 2020, few people had any idea what the world was in for. The progression was swift: borders clamped shut, authorities issued stay-at-home orders, and public life ground to a near halt. Most of the world had no experience dealing with an infectious disease outbreak of this scale. The previously unknown virus, now called SARS-CoV-2, could spread through the air, often before (or, in some cases, possibly without ever) causing any symptoms. COVID—though mild for many people—struck down elderly and more vulnerable individuals (and occasionally very healthy ones) with a vengeance, launching a wave of fear, suffering and death unlike any in recent memory. “In the beginning, when this started a year ago, we knew that it was spreading. And we knew that it also was lethal in some percentage of people,” says Stanley Perlman, a virologist at the University of Iowa, who is an expert on coronaviruses, a group that includes SARS-CoV-2. “But I don't think we had a full appreciation about how bad it was.” Among the biggest shocks was that the U.S. fared worse than most other countries, with **more than 29 million cases** and nearly 530,000 deaths as of this writing. “**We absolutely can’t say that we had the most robust response to the pandemic, up till this point, because we have had a higher death rate per capita than so many other places**,” says Monica Gandhi, a professor of medicine at the University of California, San Francisco. As the country raced to react to this new and terrifying scourge, mistakes were made that together cost hundreds of thousands of lives. Yet the tireless efforts of health care workers, along with an unprecedented vaccine push, have saved countless others. *Scientific American* interviewed scientists and public health experts about the biggest mistakes in the U.S.’s response, some of the key successes and the lingering questions that still need to be answered. Downplaying the danger and sidelining experts**.** During the pandemic’s crucial early days and weeks, then president Donald Trump and other authority figures actively minimized the virus’s threat. Trump dismissed it as no worse than the flu and said the pandemic would be over by Easter. “One thing that shouldn’t have been done is people downplaying the infection,” Perlman says. “That was a real big problem, because if you let the pandemic get out of control and don’t take it seriously, it gets worse.” The U.S. Centers for Disease Control and Prevention initially told the media that the threat to the American public was low. When a CDC spokesperson acknowledged in late February that disruptions to daily life could be “severe,” the agency was quickly sidelined—and Trump himself became the government’s main conduit for COVID updates through his daily briefings. “The Trump administration really tightly controlled what [the CDC] could put out,” says Angela Rasmussen, a virologist at the Georgetown University Center for Global Health Science and Security. This muzzling of the CDC and top government health experts made it hard for them to communicate accurate and lifesaving scientific information to the public. Under President Joe Biden’s administration, government science agencies and health officials have been given renewed respect and independence. But rebuilding public trust in these authorities will still take time. Slow and flawed testing**.** The CDC developed its own test for the virus rather than employing a German-developed one used by the World Health Organization. But the CDC test was flawed, causing a deadly delay while scientists worked out the problem. The agency was not designed to produce tests at the scale needed to spot the infections as they silently spread through the population. Meanwhile the Food and Drug Administration was slow to approve tests made by private companies, says Caitlin Rivers, an epidemiologist at the Johns Hopkins Center for Health Security. She also says the earliest criteria for getting a test were too stringent—one often had to have been hospitalized with severe symptoms and have recently traveled to a “high-risk” area. As a result of these hurdles, **the virus spread undetected for weeks. By the time testing became somewhat more available, community spread was already rampant in many places, making it difficult or impossible to do contact tracing and isolate people before they infected others.** “In this pandemic, things moved so quickly that when you screwed up for two or three weeks, it made a difference,” Perlman says. Testing availability has improved but remains uneven. Some experts have argued for the use of widespread rapid antigen testing, a type that is cheap, does not require sophisticated laboratory processing and could be done at homes, schools or offices. But some scientists still have concerns about the accuracy of these tests, and the FDA has been slow to approve them.

**There is a proposal now to expand access for COVID vaccines – but tons of WTO member states will vote against it because of pressure from the pharmaceutical industry**

**Loftus** & Hopkins **21** [Peter Loftus writes about the pharmaceutical industry and healthcare from Dow Jones' Philadelphia bureau. His coverage areas include large drug makers such as Merck and Eli Lilly, and the latest developments in drug research. He occasionally writes about non-pharmaceutical news from the Philadelphia region. Jared S. Hopkins is a New York-based reporter for The Wall Street Journal covering the pharmaceutical industry, including companies such as Pfizer Inc. and Merck & Co. He previously was a health-care reporter at Bloomberg News and an investigative reporter at the Chicago Tribune."Covid-19 Vaccine Makers Press Countries to Oppose Patent Waiver.” https://www.wsj.com/articles/covid-19-vaccine-makers-press-countries-to-oppose-patent-waiver-11622021402]

Developing countries lacking access to the **cutting-edge treatments**—or **unable to afford them**—have long pressed for waiving certain patents, notably for drugs treating HIV. The countries and patient groups have said sharing patents would allow **local** manufacturers to make the drugs for patients in those regions.

**India**, **South Africa** and other countries have limited supplies of Covid-19 **vaccines**, while the **U.S. and other rich nations** enjoy greater supplies and have vaccinated more of their populations.

They first proposed to the WTO last year temporarily waiving vaccine patents. The countries raised the volume on their request in recent months as their cases surged.

The U.S. typically objects to patent waivers. The Biden administration was facing pressure from developing countries to release more of its own vaccine supplies when it said it supports the **temporary waiver**.

Drugmakers fear a Covid-19 vaccine waiver could set a precedent for sharing intellectual property of other medicines.

In the two weeks since the Biden administration’s move, trade groups such as the International Federation of Pharmaceutical Manufacturers & Associations have sought to bolster the opposition of other developed countries adverse to a temporary waiver.

The groups are telling developed countries that waivers would further strain the world’s limited supply of raw materials for vaccines, the people familiar with the lobbying said. Waiving patents wouldn’t also provide an immediate solution, the groups are saying, because it would take months to transfer the technology and build manufacturing capacity.

The groups are urging the countries to instead remake government policies that restrict the export of doses and materials, and to facilitate voluntary partnerships among companies to produce vaccines, the people said.

More than 100 countries support the waiver but **many don’t**, including some **European Union members**.

Pfizer this month sent a letter to **Australian** government officials stating that waiving intellectual-property protections for vaccines is “a distraction from the real solutions to improve vaccine access.” The country has so far expressed **opposition to a waiver**.

At the same time, vaccine makers have made several **announcements** saying they are increasing capacity to send doses, through an international initiative called Covax, to developing nations.

**COVID highlights just how vulnerable we are to both natural pandemics and man-made biological weapons – the deciding factor in effective response is ensuring people can be vaccinated as fast as possible**

**Lyon 21** [Regan F Lyon, 7-1-2021, "COVID-19 Response Has Uncovered and Increased Our Vulnerability to Biological Warfare," OUP Academic, https://academic.oup.com/milmed/article/186/7-8/193/6135020]

The 2018 National Biodefense Strategy (NBS) articulated a collaborative plan to prevent, detect, and respond to biological threats to the USA.1 The NBS highlights recent, isolated outbreaks of Systemic Acute Respiratory Syndrome (SARS), Ebola, and Zika viruses as warnings to nation states and justification for enhanced biological threat responses. Although these events are not considered deliberate threats, clandestine bioweapon programs and terrorist groups seeking such programs are known to exist and capitalize on such natural outbreaks.1 The NBS’s emphasis on prevention and response drives the requirement to enhance biological weapon deterrence and defense strategies to avert the employment of biological weapons on U.S. civilians or military personnel.1 **The public health crisis that ensued with SARS-associated coronavirus-2 (SARS-CoV-2) has highlighted our nation’s bioweapon vulnerabilities on the international stage and has the potential for disastrous effects on national security.** Previous questions regarding how the USA would respond to a large biological outbreak (or biological weapon) have now been answered for potential adversaries across the world. The ambiguity of both our capabilities and weaknesses, which provided deterrence to adversarial employment of biological weapons before the pandemic, no longer exists. This article will provide an overview on biological weapons and the concepts of deterrence and defense in the context of bioterrorism. Then, it will analyze how the national personal protective equipment (PPE) shortage, public resistance to public health measures, the anti-vaccination movement, and USNS (United States Navy Ship) Comfort deployment to New York City have increased our vulnerability to bioterror attack by impacting our deterrence and defense measures. Finally, it will offer recommendations to restore our bioterrorism security after the detrimental effects from the events unfolding in the USA. BIOLOGICAL WEAPONS REGULATIONS, DETERRENCE, AND DEFENSE Even though biological warfare is considered a “weapon of mass destruction” and is prohibited by a treaty drafted by the 1972 United Nations Biological Weapons Convention (BWC), not all adversaries adhere to these standards. Terrorist groups and covert operations have utilized biological weapons for small operations because the actors, by nature, are either non-eligible to ratify the treaty or would not do so if they could. Although there have been no intentional large-scale attacks, especially by adversarial nation states, this is not guaranteed to be the case in the future.2 The BWC does not prohibit ratified nations from having pathogens or toxins for peaceful purposes, **such as the development of vaccines**. After the natural outbreak of smallpox and its subsequent eradication accomplished by the World Health Organization in 1980, less virulent poxviruses have continued to be used in a variety of laboratories for research and development of vaccines for a variety of diseases.3 The original, more deadly strain of smallpox has been retained at two facilities in Russia and Atlanta.4 Because smallpox’s virology makes it an ideal biological weapon, the samples in Atlanta and Russia offer defense through researching countermeasures should an attack occur and simultaneously provide a repository from which a biological weapon can be acquired. “Deterrence” and “defense” are two concepts which are typically described in terms of nuclear warfare, but they can also be applied to national security from a biological attack.5 Deterrence is the ability to prevent an adversary from taking some action during peacetime.5 For biological warfare deterrence, vaccines and preventative medicine measures prevent susceptibility to a microbe. For a largely vaccinated and/or health-conscious population, the costs of production, storage, and dissemination of a bioweapon greatly outweighs the rare chance of the target contracting the disease. New Zealand’s robust public health measures, citizen compliance, and continued efforts to sustain a caseload under 20 since April is a strong deterrent for biological attack.6 Defense mechanisms decrease the effectiveness of the attack, putting a high cost-to-benefit burden on the adversary.5 A defense measure for bioterrorism would be an adequate medical treatment response to casualties of the bioweapon, decreasing mortality and the overall effectiveness of the weapon. COVID-19 PANDEMIC ANALYSIS The novel SARS-CoV-2 has several characteristics of an ideal biological weapon, including high transmission rate, long incubation period, airborne transmission, and significant morbidity/mortality.7 In fact, early in the pandemic, suspicion was cast that the virus was being developed as a biological weapon by a laboratory in Wuhan, China.8 Although these allegations have been deemed conspiracy theories as a result of misinformation operations, the resulting pandemic and the panicked public share similarities to a bioterror attack. The events occurring within the USA during the coronavirus disease 2019 (COVID-19) pandemic create a global narrative on how we respond to a biological crisis. The 2018 NBS emphasized the continued threat of biological weapons to national security and identified the need to deter and defend against bioterrorism acts.1 This section will analyze events in the USA during the pandemic, how they bolstered or negated our current bioterrorism deterrence or defense strategies, and offer areas for improvement to restore our bioterror security.

**Reducing IP restrictions on medicine is essential for expanding access – especially in developing countries, where lack of capital and domestic industry makes the same people who are most vulnerable to diseases the least likely to have access to expensive brand-name drugs**

**Baird 13** [Sean, Boston College of Law. Magic and Hope: Relaxing Trips-Plus Provisions to Promote Access to Affordable Pharmaceuticals. Boston College Journal of Law & Social Justice, 33(1), 107-145, 2013, http://lawdigitalcommons.bc.edu/jlsj/vol33/iss1/4, accessed 7-31-21]

**TRIPS-Plus provisions** in U.S. FTAs **impede access to pharmaceuticals for indigent populations**.42 The similarities between U.S. patent law and the TRIPS Agreement demonstrate the United States's influence in establishing global intellectual property standards.43 Despite the suc- cess of the United States in shaping global intellectual property stan- dards, the TRIPS Agreement **maintains several flexibilities**, namely data exclusivity and compulsory licensing, which were affirmed by the Doha Declaration.44 The United States's dissatisfaction with the level of intellectual property protection afforded by the TRIPS Agreement prompted the **proliferation of TRIPS-Plus provisions in U.S. FTAs**.45

A. Values and Ideals in U.S. Patent Law

The preeminence of patents in the United States is evidenced by the fact that patents are constitutionally protected to promote innova- tion and discovery.46 A patent is a grant of property issued by a gov- ernment that provides limited rights to the patent owner.47 A patent owner in the United States is granted monopolistic control over his or her invention for twenty years, during which time no one may make, sell, or use the patented product, absent permission from the patent holder.48 This exclusive right promotes innovation by enabling the pat- ent owner to avoid pricing competition when selling the patented product.49 In return for monopolistic power to exclude, a patent owner must disclose the technological processes and data behind the prod- uct.50 Other producers use this information, saving on the cost of re- search and development while also expediting the regulatory process, in order to offer competitive pricing when the patent terminates.51

Patents are particularly valuable to the drug industry given the plethora of research and development required to produce pharma- ceuticals.52 When a drug is no longer under patent, pharmaceutical companies must compete with generic producers who provide medi- cines at much lower prices.53 Pharmaceutical companies assert that re- search and development challenges require a rigid patent system to recover investment, turn profit, and promote continued innovation.54

In the context of international trade, pharmaceutical companies have much at stake as LMICs produce generic versions of patented drugs and sell these medications around the world, undercutting brand- name profitability.55 Although the pharmaceutical industry ranks as one of the most profitable industries in the United States, these patent con- cerns have led to the development of powerful special interest groups that the United States relies on when considering trade agreements, in- cluding the TRIPS Agreement.56

B. Global Expansion of U.S. Patent Ideals Through the TRIPS Agreement

The combination of special interests and traditional value placed on patent protection has encouraged the United States to enforce its patent ideals globally by linking patent protection and international trade through the TRIPS Agreement.57 Touted as "unquestionably the most important development in international intellectual property law [in a century]," the TRIPS Agreement "attempts to strike a balance be- tween the long term social objective of providing incentives for future inventions and creation, and the short term objective of allowing peo- ple to use existing inventions and creations."58 To accomplish this, the agreement requires all WTO signatories to implement minimum stan- dards of intellectual property law.59

The United States's influence is acutely evident throughout the TRIPS Agreement's patent provisions, which practically mirror U.S. patent law.60 For example, like U.S. patent law, the TRIPS Agreement grants patent owners exclusive rights to prevent others from making, using, selling, or importing the patented product for twenty years.61 Moreover, neither the TRIPS Agreement nor U.S. patent law permits exceptions for patenting pharmaceuticals or pharmaceutical proc- esses.62 Both the United States and the TRIPS Agreement prohibit the use of compulsory licensing for products not developed locally.63 Lastly, both the United States and the TRIPS Agreement stipulate that in ex- change for a period of monopolistic control, the patent owner must disclose the invention "in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art . . . ."64

Although the United States was largely successful in expanding its patent ideals through the TRIPS Agreement, LMICs maintained considerable flexibility to promote access to drugs.65 This success is highlighted by the TRIPS Agreement's treatment of **data exclusivity** and **compulsory licensing**.66

1. Data Exclusivity

The TRIPS Agreement requires patent holders to disclose relevant information regarding the development of the patented product, in- cluding clinical data.67 Pharmaceutical companies invest a significant amount of time and money to develop the clinical data required to patent new drugs.68 Generic drug companies rely on the clinical data collected by brand-name drug companies in order to demonstrate that the generic drug is pharmacologically equivalent to the brand-name pharmaceutical.69 In doing so, generic producers avoid the inordinate time and expense required to generate this data, enabling expeditious regulatory approval and delivery of affordable medicines upon the ex- piration of brand-name patents.70 The TRIPS Agreement requires pro- tection of such data but affords signatories broad discretion to utilize clinical data to protect the public and promote public health, as long as steps are taken to prevent unfair commercial use.71 Moreover, scholars contend that in light of the TRIPS Agreement's purpose and objectives, the agreement does not require a period of data exclusivity, contrary to U.S. patent law.72

2. Compulsory Licensing

A compulsory license is a government authorized license to a third party for the purpose of manufacturing and producing a patented in- novation without consent from the patent owner.73 Article 31 governs compulsory licenses under the TRIPS Agreement, granting a govern- ment broad discretion in issuing these licenses.74 The following re- quirements must be met in order to obtain a compulsory license: (1) the country must ensure that the third party seeking the license at- tempts to obtain authorization from the patent holder on reasonable commercial grounds; (2) the scope and duration of the compulsory license must be limited to the purpose for which the license was author- ized; (3) the compulsory license must be predominately used "for the supply of the domestic market of the Member authorizing such use;" and finally (4) the country must provide the patent holder with "ade- quate remuneration . . . taking into account the economic value of the authorization."75 Article 31 may be waived in cases of extreme urgency, national emergency, or public non-commercial use.76

Although HICs and LMICs reached a compromise on compulsory licensing, the issue became increasingly contentious upon implementa- tion.77 HICs were dismayed with the lack of clarity surrounding terms like "adequate remuneration" and "national emergency."78 LMICs were frustrated with Article 31(f) which stipulates that compulsory licenses must be predominately used for distribution within the domestic mar- ket.79 Because many low-income countries lack manufacturing capacity, compulsory licensing under Article 31 does not provide a viable method of obtaining pharmaceuticals at a competitive price.80 At the same time, alarm over HIV/AIDS, malaria, and tuberculosis grew as developing countries struggled to contain and treat infectious disease epidemics.81 These concerns led to the signing of the Doha Declaration at the WTO Ministerial Conference in 2001.82

C. A Blow to U.S. Interests: The Doha Declaration and Article 31bis

As WTO signatories began implementing the TRIPS Agreement, the scourge of HIV/AIDS proliferated and infections increased by ten percent from 2000 to 2001.83 At that time, the World Health Organization estimated that less than four percent of those in need of HAART had access.84 It is in this context that the Doha Declaration "recog- nize[d] the gravity of the public health problems afflicting many [LMICs], especially those resulting from HIV/AIDS, tuberculosis, ma- laria and other epidemics."85 WTO delegates agreed that signatories should interpret and implement the TRIPS Agreement in a way that promotes public health and access to medicines for all.86

Intellectual property flexibilities promoted by the TRIPS Agree- ment were **reaffirmed in the Doha Declaration**.87 Specifically, the Doha Declaration implicitly affirmed the TRIPS Agreement's deferential data exclusivity provisions and explicitly confirmed the use of compulsory licenses.88 The Doha Declaration granted broad discretion with regard to compulsory licensing, asserting that WTO signatories have "the right to grant compulsory licences [sic] and the freedom to determine the grounds upon which such licences [sic] can be granted."89 Perhaps most importantly, the Doha Declaration recognized the ineffectiveness of compulsory licensing for countries with limited or no manufacturing capacity.90 To address this weakness, WTO signatories amended the TRIPS Agreement with Article 31bis, which enables countries with lim- ited or no manufacturing capacity to import generic drugs from other countries, thereby promoting access to more affordable medicines.91

Despite the Doha Declaration's affirmance of **deferential data exclusivity** and **compulsory licensing** as valuable mechanisms to **promote access to medicine**, the United States dominated the TRIPS Agreement negotiations.92 A World Bank study concluded that low-income countries stand to lose twenty billion dollars from transfers of technology, including pharmaceuticals, if the TRIPS Agreement is fully imple- mented.93 Still, the United States had to accept compromises during the negotiations and has remained discontent with the level of protection afforded to pharmaceutical patents by the TRIPS Agreement.94 This dissatisfaction spurred the **proliferation of TRIPS-Plus provisions** in bilateral U.S. FTAs.95

D. The Proliferation of TRIPS-Plus Provisions in U.S. FTAs

The TRIPS Agreement creates a regulatory "**floor**," consisting of minimum levels of protection that must be afforded to intellectual property by all WTO signatories.96 Countries are therefore permitted to seek **higher levels of protection in FTAs**, and the United States has done so in negotiating bilateral FTAs with numerous countries.97 These trade agreements are commonly called **TRIPS-Plus** U.S. FTAs because they incorporate **more stringent** intellectual property protection provisions than the TRIPS Agreement, while also limiting the freedoms and flexibilities provided by the TRIPS Agreement.98

Beginning with the Bush administration and continuing through the Obama administration, the U.S. has sought to "ensur[e] that the provisions of any multilateral or bilateral trade agreement governing intellectual property rights that is entered into by the United States re- flect a standard of protection similar to that found in United States law."99 Pressure from the pharmaceutical industry led to the implementation of several TRIPS-Plus provisions, including **rigid data exclusivity policies** and **limitations on compulsory licensing**, thereby **impeding access** to **affordable medicines** for **indigent populations in desperate need**.100

1. TRIPS-Plus Impact on Data Exclusivity Provisions

TRIPS-Plus data exclusivity provisions in U.S. FTAs constrict the flexibilities afforded by the TRIPS Agreement.101 Whereas the TRIPS Agreement applies a **deferential approach** towards data exclusivity, U.S. FTAs apply the same level of protection afforded **under U.S. patent law**.102 In U.S. FTAs, competing manufacturers are **prohibited from relying on clinical data** for **five to fifteen years** after the date of a pharmaceutical's initial regulatory approval.103 Brand-name pharmaceutical companies **favor data exclusivity provisions** because they enable drug companies to **exploit profits by suspending competition**.104

**Clinical data is costly and time consuming**, and data exclusivity provisions may **prohibit** generic producers from introducing **more affordable medication immediately following a patent's expiration** by **prohibiting access to data previously gathered by the patent holder**.105 To compete, generic producers may be forced to **conduct their own costly r**esearch a**n**d **d**evelopment, negating their ability to **provide affordable drugs**.106 Alternatively, generic companies would have to **delay regulatory approval** and **production of generic drugs**.107 Thus, TRIPS- Plus data exclusivity provisions in U.S. FTAs effectively empower patent holders to **extend monopolistic control of pharmaceuticals** by **obstructing generic competition**, consequently **diminishing access to medicines for indigent populations**.108

2. TRIPS-Plus Impact on Compulsory Licensing

Although to the TRIPS Agreement enables WTO signatories to es- tablish their own national compulsory licensing scheme, TRIPS-Plus provisions in U.S. FTAs **significantly limit compulsory licensing**.109 Under U.S. FTAs, parties may typically only grant compulsory licenses in **emergency situations**, as an anti-trust remedy, or for public non- commercial use.110 Notably, U.S. FTAs do not define "emergency situa- tions" or "public non-commercial use."111 Some TRIPS-Plus provisions require "reasonable and entire" remuneration for patent owners as op- posed to "adequate remuneration" required by the TRIPS Agree- ment.112 Finally, U.S. FTAs permit challenges to compulsory licenses on the grounds that a license was not warranted under the specific circum- stances.113 By **confining** a government's ability to issue compulsory licenses and providing an opportunity for the patent holder to **challenge the issuance of compulsory licenses**, TRIPS-Plus compulsory licensing provisions diminish a generic producer's ability to **compete** and enable the patent holder to **manipulate drug pricing**.114 The net result is **diminished access to medicines** for Hope Tukahirwa and millions like her.115

II. Why TRIPS-Plus Provisions are Problematic: Rigid Data Exclusivity Provisions and Compulsory Licensing Provisions Obstruct Access to Medicine

TRIPS-Plus provisions promote **unyielding data exclusivity** and **limit compulsory licensing** to the **detriment of indigent populations** **lacking access to affordable pharmaceuticals**.116 Data exclusivity provisions in U.S. FTAs with **Guatemala** and **Vietnam**, two countries struggling with **staggering poverty**, have led to **increased pharmaceutical prices** by **delaying generic competition**.117 Moreover, the exclusion of compulsory licensing from FTAs or proposed FTAs with the **D**ominican **R**epublic, **Thailand**, and the Southern African Customs Union (**SACU**) could lead to **overwhelming public health challenges** as **generic competition** is **strangled** from the market while patent holders maintain **monopolistic control over pharmaceutical prices**.118

A. Examples of How Rigid TRIPS-Plus Data Exclusivity Provisions Have Had a Deleterious Effect on Public Health

U.S. FTAs include rigid data exclusivity provisions that ultimately obstruct generic drug competition, resulting in disastrous public health consequences for destitute populations.119 Trade agreements with Gua- temala and Vietnam illustrate the injurious effect that data exclusivity provisions have on access to affordable drugs.120

1. Guatemala

The number of people living with HIV/AIDS in Guatemala has doubled since 2001; an estimated 62,000 people are living with the dis- ease and less than 11,000 are receiving antiretroviral therapy.121 Fur- thermore, approximately twenty percent of Guatemala's largely rural population lacks regular access to health facilities and services.122 TRIPS-Plus data exclusivity provisions exacerbate these public health concerns by restricting access to affordable pharmaceuticals in Guate- mala where over fifty percent of the population lives below the national poverty line.123

The U.S.-Dominican Republic-Central American Free Trade Agreement (DR-CAFTA) came into effect in Guatemala in 2006.124 The DR-CAFTA is an agreement between the United States and six Central American countries, namely Costa Rica, El Salvador, Guatemala, Hon- duras, Nicaragua, and the Dominican Republic.125 Rigid data exclusiv- ity provisions in the DR-CAFTA have prohibited a number of generic drugs from entering the Guatemalan pharmaceutical market, despite the fact that many of these drugs may successfully treat major causes of morbidity and mortality.126 For example, Pfizer's Vfend, which is used to treat invasive fungal infections generally found in patients with com- promised immune systems (like those suffering from HIV/AIDS), costs 810% more than the generic version.127 Vfend, however, is subject to fifteen years of data exclusivity, thus barring generic producers' access to clinical information, quashing competition, and granting Pfizer mo- nopolistic pricing control.128

Similarly, data exclusivity provisions have restricted access to af- fordable antiretrovirals.129 For example, the Guatemalan government provides a list of drugs that public organizations may procure at subsi- dized costs.130 A generic antiretroviral was registered in 2004, yet when Abbott Laboratories' patented version of the same drug, Kaletra, which costs 166% more than the generic pharmacological equivalent, was reg- istered a year later, it was granted retroactive data exclusivity through 2000-the patent expires in 2015.131 Accordingly, only Kaletra, and not the generic version, has been listed by the Guatemalan government as available through subsidized costs.132 Public organizations seeking the more affordable generic drug are required to procure the drug else- where.133 Thus, rigid TRIPS-Plus data exclusivity provisions in the DR- CAFTA have reduced or eliminated generic pharmaceutical competi- tion, resulting in an inordinate pricing structure making critical drugs unavailable to much of Guatemala's indigent population.134

2. Vietnam

The United States signed a trade agreement with Vietnam in 2000.135 When Vietnam adopted data exclusivity provisions as part of the agreement, the United States praised the country for its alignment with U.S. data exclusivity standards.136 From 2000 through 2005, the Vietnamese government saw a threefold increase in health spending, much of which was attributed to rising pharmaceutical costs.137 This is particularly evident in the pricing of antiretrovirals produced in Viet- nam, which cost five to seven times more than the lowest international prices for the same pharmaceuticals.138

The precipitous increase in the cost of antiretrovirals occurred as HIV/AIDS became increasingly problematic in Vietnam.139 In 2009, an estimated 280,000 people were living with HIV/AIDS, a figure that has doubled since 2001, shortly after the U.S.-Vietnam Trade Agreement was reached.140 Nearly seven percent of all people living with HIV/AIDS in Southeast Asia live in Vietnam.141 In 2009, over fourteen thousand Vietnamese died from AIDS related causes.142 Additionally, only half of those in need of HAART currently receive antiretroviral therapy.143 Un- der these conditions, stringent data exclusivity provisions limit access to medicines in Vietnam, exacerbating an already dire public health situa- tion in a country where fifteen percent of the population lives below the national poverty line.144

For example, like many LMICs, Vietnam requires greater access to second-line antiretroviral treatment.145 As HIV/AIDS evolves, it may grow resistant to first-line treatment, requiring second-line drugs, many of which are patented by multinational pharmaceutical companies.146 One of these second-line pharmaceuticals is Kaletra from Abbott Labo- ratories.147 It was recently reported that Abbott Laboratories has a pat- ent pending for Kaletra in Vietnam, and it intends to use that patent to prevent the procurement of generic alternatives.148 Unyielding TRIPS- Plus data exclusivity provisions prohibit the use of clinical data for at least five years (and upwards of fifteen years, as seen in Guatemala), thereby eliminating generic competition for a pharmacological equiva- lent to Kaletra.149 Thus, Abbott Laboratories will be able to charge in- ordinate prices, rendering access to affordable pharmaceuticals unat- tainable for low-income populations gravely in need of second-line antiretroviral therapy.150

B. U.S. Policy Towards Compulsory Licensing Severely Harms Public Health in Middle and Low-Income Countries

TRIPS-Plus provisions in U.S. FTAs discourage the use of **compulsory licensing** thereby restricting **generic competition** and furthering a patent holder's **monopolistic control of pricing**, which results in **restricted access to affordable drugs**.151 These potentially negative effects of U.S. policy towards compulsory licensing are illustrated in two proposed, but stalled, FTAs with Thailand and the Southern African Customs Union.152

1. Dominican Republic

The island of Hispaniola, comprised of the Dominican Republic and Haiti, contains approximately eighty-five percent of all HIV/AIDS cases in the Caribbean, the region with the second highest per capita prevalence of HIV/AIDS after sub-Saharan Africa.153 In 2009, an esti- mated 57,000 people living with HIV/AIDS were domiciled in the Do- minican Republic, with 3,200 new infections that year.154 Also in 2009, an estimated 2,300 people died from AIDS-related causes.155 TRIPS- Plus compulsory licensing provisions further exacerbate the Dominican Republic's public health landscape by contributing to rising pharma- ceutical costs and discouraging generic competition, thereby limiting access to affordable drugs in a country where fifty percent of the popu- lation lives below the national poverty line.156

Although it has never issued a compulsory license, the Dominican Republic maintains liberal compulsory licensing provisions in its na- tional intellectual property law.157 Moreover, the Dominican Republic's commitment to compulsory licensing as a vital mechanism for securing access to medicines is evidenced by the fact that the Dominican Repub- lic was a sponsor of both the Doha Declaration and the Article 31bis Amendment, which sought to ease the process for issuing compulsory licenses.158 The Dominican Republic also maintains a strong generic pharmaceutical industry with generic firms controlling approximately fifty percent of the domestic pharmaceutical market.159 In fact, the in- troduction of generic antiretrovirals in the Dominican Republic led to a ninety-nine percent decrease in their cost.160

The Dominican Republic ratified the DR-CAFTA on March 1, 2007.161 TRIPS-Plus provisions in the DR-CAFTA have been character- ized as the most "onerous" protections among all U.S. FTAs with LMICs.162 Researchers assert that by 2027, the Dominican Republic will experience a nine to fifteen percent increase in pharmaceutical prices as a result of the DR-CAFTA.163 Evidence of TRIPS-Plus compulsory licensing provisions on price increases and diminished access to phar- maceuticals, however, is already prevalent as illustrated by the second- line antiretroviral Efavirenz, which costs three times more than its ge- neric pharmacological equivalent.164

TRIPS-Plus patent provisions in the DR-CAFTA effectively bar com- pulsory licensing by linking marketing approval of generic pharmaceu- ticals to the consent of patent holders.165 Thus, if a generic drug com- pany developed the pharmacological equivalent to Efavirenz under a compulsory license issued by the Dominican Republic, the generic pro- ducer would still be required to obtain consent from the patent holder to sell the generic version of the drug, which is highly unlikely.166 Be- cause debilitating poverty prohibits procurement of brand name Efavirenz and compulsory licensing provisions constrict generic compe- tition, Dominicans are forced to use a similar but slightly more harmful drug, Nevirapine.167 Nevirapine may weaken a patient's immune system if provided too early in the progression of HIV/AIDS, thereby further compromising the patient's health.168 By delaying treatment, however, individuals diagnosed with HIV/AIDS face the same risk of a weakened immune system.169

Given rampant poverty and rising pharmaceutical costs, one healthcare provider suggested that Dominicans have the bleak choice of, "[buying] medication [or] buying lunch."170 TRIPS-Plus compulsory licensing standards included in the DR-CAFTA have paralyzed the Do- minican Republic from utilizing this TRIPS-compliant method of pro- viding affordable access to antiretrovirals and other drugs.171

2. Thailand

In 2002, an estimated 670,000 people were living with HIV/AIDS in Thailand.172 The Thai government recognized the threat posed by the pandemic and initiated a national HIV/AIDS program aiming to provide its citizens with universal access to HAART.173 The program has been widely successful; the number of people receiving treatment rose from 3,000 in 2002 to 52,000 by 2005.174 The annual number of HIV/AIDS related deaths prior to the universal access program was ap- proximately 52,000, but in 2009, after several years of universal access, that number decreased by nearly fifty percent.175 By 2010, nearly sev- enty percent of those in need of antiretroviral therapy received treat- ment.176 Thailand's commitment to universal access to antiretroviral therapy has been praised by the World Health Organization and non- governmental organizations from around the world.177 The most criti- cal aspect to the success of the universal access program has been the Thai government's ability to promote the availability of inexpensive generic antiretrovirals.178

To ensure the success of the HIV/AIDS program, however, Thai- land required access to patented second-line pharmaceuticals.179 These patented medications are significantly more expensive than the generic alternatives.180 For example, Abbott's Kaletra cost well over two thou- sand dollars per patient per year, limiting the Thai government's provi- sion of the medication to six hundred patients out of eight thousand in need.181 The World Bank reported that by issuing compulsory licenses, Thailand could reduce the cost of second-line antiretroviral treatments by ninety percent.182 Thailand attempted to negotiate reduced prices for several pharmaceuticals, including Kaletra, but failed to reach an agreement.183 Thus, in late 2006 and early 2007, the Thai government issued compulsory licenses for two antiretrovirals, including Kaletra, and a third compulsory license for Plavix, a pharmaceutical used to treat cardiovascular disease.184

The United States and Thailand began negotiating a trade agree- ment in 2004, but suspended negotiations in 2006 following a military coup in Thailand.185 The World Bank concluded that TRIPS-Plus provi- sions in the proposed U.S.-Thailand FTA would have crippled Thai- land's ability to issue compulsory licenses, resulting in costs exceeding 3.2 billion dollars over twenty years.186

U.S. FTAs permit challenges to compulsory licenses on the grounds that the license was not warranted under the specific circumstances.187 Given that Abbott Laboratories and Thailand were unable to reach an agreement about the price of Kaletra, it is likely that Abbott Laborato- ries challenged the Thai government's decision to issue a compulsory license.188 In fact, Abbott was so furious with Thailand's issuance of a compulsory license for Kaletra, that it withdrew several pending phar- maceutical patents from Thailand-an unprecedented move in which a U.S. drug company retaliated against a foreign government by cutting off the supply of certain pharmaceuticals.189 If Abbott Laboratories were to prevail in such a challenge, Thailand may have been subject to U.S. sanctions and may have been required to discontinue the license.190 Thus, rigid TRIPS-Plus compulsory licensing provisions in the proposed U.S.-Thailand FTA may have curbed Thailand's use of this critical mechanism for improving access to affordable antiretrovirals necessary for Thailand's remarkably successful HIV/AIDS program.191

3. The Southern African Customs Union

Perhaps nowhere on Earth has the scourge of HIV/AIDS afflicted more people than the members of the Southern African Customs Un- ion (SACU), which is comprised of Botswana, Lesotho, Namibia, South Africa, and Swaziland.192 The SACU is burdened by over twenty percent of the global HIV/AIDS epidemic, as approximately seven million peo- ple living with HIV/AIDS inhabit SACU member countries.193 The SACU member countries are rife with poverty as nearly one-quarter of the population in each country live below the national poverty line.194 This rampant poverty has quashed access to antiretrovirals, with less than sixty percent of those in need of treatment currently receiving therapy.195 Despite extreme poverty, the SACU forms a formidable trad- ing block and has agreed to treaties with several European countries, South American countries, and is in the midst of negotiating a trade agreement with India.196

In fact, in 2003, the United States and the SACU entered negotia- tions to establish a U.S.-SACU FTA.197 The United States insisted on sev- eral TRIPS-Plus provisions, many of which are similar to those included in current U.S. FTAs.198 The SACU nations expressed particular con- cern over the proposed compulsory licensing provisions.199 The United States sought to impose a ban on exportation of pharmaceuticals devel- oped by compulsory licenses, which would have prohibited South Af- rica's generic pharmaceutical industry from supplying SACU nations with affordable drugs, including antiretrovirals.200 Thus, rigid TRIPS- Plus compulsory licensing provisions in the proposed U.S.-SACU FTA would have compromised access to generic drugs that SACU nations rely on to handle the scourge of HIV/AIDS in sub-Saharan Africa.201

The SACU refused the TRIPS-Plus provisions that the United States obstinately sought, recognizing that such compulsory license provisions would limit the delivery of affordable medicines, and as a result, nego- tiations stalled in 2006.202 Nevertheless, in 2008, the United States and the SACU signed a Trade, Investment, and Development Cooperative Agreement that "establishes a forum for consultative discussions, coop- erative work, and possible agreements on a wide range of trade issues" which would "[i]deally . . . put in place the 'building blocks' for a future FTA. . . ."203 Given the tremendous burden of HIV/AIDS on SACU na- tions, standard U.S. TRIPS-Plus compulsory licensing provisions could provoke devastating consequences.204

III. Promoting Access to Medicine Through Amendment of U.S. FTAs

TRIPS-Plus provisions in U.S. FTAs have come under fire and have even been criticized by Congress.205 The congressional response to TRIPS-Plus provisions in the Bipartisan Agreement on Trade Policy has **fallen short** of addressing the burdensome data exclusivity and compulsory licensing provisions in U.S. FTAs.206 To remedy these shortcom- ings, the United States should amend all U.S. FTAs to incorporate a balancing test that would provide review panels an opportunity to weigh the benefits and detriments associated with relaxing data exclu- sivity and compulsory licensing provisions for various drugs.207

**Only 0.9% of the developing world has the vaccine – capacity to produce it exists, but intellectual property restrictions are preventing production. Expanding access is key – it stops mutations and variants that take us back to square one on COVID**

**Erfani** et al **21** [Parsa Erfani MD Candidate at Harvard Medical School. "Intellectual property waiver for covid-19 vaccines will advance global health equity." https://www.bmj.com/content/374/bmj.n1837]

By late June 2021, **46% of people** in high income countries had received at least one dose of the covid-19 vaccine compared with 20% in middle income countries and **only 0.9% in low income countries**.1 This inequity has been driven by a global political economy that has permitted some countries to purchase more vaccine than they require while others have very limited supplies. Canada, for example, with a gross domestic product (GDP) of $46 000 (£32 000; €39 000) per head has vaccines for 434% of its population, whereas Jordan, which has twice the incidence of covid-19 and a GDP of $4400 per head, has secured doses for only 6% of its people.2 As covid-19 **variants** are **already showing** some ability to evade the current vaccines, it is evident that without global vaccine **equity** and **immunity**, our efforts against covid-19 are in **jeopardy**.

Equitable vaccine distribution to the world’s **highest risk populations** requires a multipronged approach that includes vaccine development and approval; scaling manufacturing; streamlining shipment, storage, and distribution; and building vaccine confidence. International collaborations have helped tackle several of these fundamentals. However, the global community remains deeply divided on how to overcome the **scarcity of supply**. Pharmaceutical trade associations claim that supply is not a problem as manufacturers can supposedly provide 10 billion doses by the end of 2021.3 But as suppliers consistently fall short in achieving manufacturing targets, production is clearly a bottleneck to global vaccination.3 Indeed, at the current global vaccination rate, it will take years to achieve the needed level of global immunity.4

The barrier to adequate vaccine supply today is not lack of vaccine **options**, nor even theoretical **production capacity**; the problem is the intellectual property (**IP**) protection governing production and access to vaccines—and ultimately, the political and moral will to waive these protections in a time of **global crisis**. Without such liberty, there will not be **enough vaccine fast enough** to prevent the spread of variants, the avoidable deaths, and the continued choking of low and middle income countries (LMICs) through poor health.

**Preventing pandemics should be our main priority – climate change and a host of other factors make them more common and more dangerous, so ensuring we are as ready as possible is key**

**CAN 17,** California Nurses Association, January 2017, “SARS, EBOLA, AND ZIKA: What Registered Nurses Need to Know About Emerging Infectious Diseases,” accessed via Google Cache

[ INTRODUCTION ] Infectious diseases are a part of life, from the bubonic plague of the 15th century that decimat- ed populations in Europe to the Ebola outbreak of 2015 that has killed over 10,000 people in West Africa. Science and technology have allowed us to escape the effects of many diseases like yellow fever and rubella through vaccines. Since 1975, however, over **30 new diseases have appeared**, including **AIDS**, **Ebola**, **Lyme disease**, **Legionnaires’** disease, and **antibiotic-resistant organisms**. Most of these new infections are caused by pathogens present in the environment but infecting a **new host** or **different population**. Rarely, new pathogens may **evolve** to cause a new disease. New or newly noticed diseases are not the only concern. **Old diseases**, like malaria and cholera, have made **comebacks**. **Underfunded**, declining **public health** programs and **crowded poor urban environments** foster the transmission of diseases that spread through social contact between peo- ple, like **tuberculosis and diphtheria**. Vector-borne infections have also reappeared due to **climate change** and human disruption of ecosystems. **Arboviruses**, which are viruses spread by mosqui- toes and ticks, are responsible for more than 130 human diseases and the ranges of the vectors are rapidly expanding. Nurses are at the forefront of healthcare and are in a position to recognize new and re-emerging infectious diseases. Nurses are often the first to be exposed to infectious diseases. During an ongoing epidemic, little may be known about the disease, how it is transmitted, or what kinds of protections healthcare workers need. In these situations, it is vital — literally — that hospitals and other healthcare employers adhere to the precautionary principle — even in the face of scientific uncertainty, protective measures should be taken. In this home study, you will read about three recently emerged or re-emerged infectious dis- eases. Primary and secondary sources are used to demonstrate the kinds of literature that emerge surrounding infectious disease outbreaks. The conditions that led to the rise and/or spread of the outbreak into an epidemic are discussed. I. SEVERE ACUTE RESPIRATORY SYNDROME (SARS) The first major epidemic of the 21st century, the SARS epidemic of 2003 began in China and spread globally. The progression of the epidemic is described and the forces of urbanization and globalization on the emergence of the novel disease are discussed. II. ZIKA VIRUS DISEASE The current Zika epidemic began in Brazil in 2015 and has rapidly expanded to other Latin American and Caribbean countries in late 2015 and early 2016. The status of the epidemic is described. The impact of climate change and fragmented public health infrastructure on the emergence of the epidemic are discussed. III. EBOLA VIRUS DISEASE The origin and progression of the 2014 Ebola epidemic originating in West Africa is described. The spread of Ebola to the United States is dis- cussed in detail. The contributions of inadequate protections for healthcare workers and the frag- mented public health infrastructure of the United States are discussed. Page 3 3 [ SECTION I ] SEVERE ACUTE RESPIRATORY SYNDROME (SARS): FROM CHINA TO TORONTO A previously unknown respiratory disease began ailing people in the southern Chinese province Guangdong in late 2002. It spread rapidly across Asia and around the world, causing severe acute respiratory syndrome (SARS). This epidemic was the first major infectious disease epidemic of the 21st century and forced the need to reshape understanding of public health as global instead of national. The story of SARS clearly demonstrates the impact of urbanization and globalization on emerging infectious diseases. It also demonstrates how unprepared public health infrastructure can prolong an epidemic. By the end of 2003, all cases worldwide had been treated and the epidemic was over. Probable SARS cases were identified in 8,096 people worldwide and infection resulted in 774 deaths. On May 20, 2003, the World Health Organization (WHO) published a status report on the epidemic. This excerpt describes how the epidemic was started, which was an important discovery for breaking the transmission cycle. Excerpt below from: Severe acute respiratory syndrome (SARS): Status of the outbreak and lessons for the immediate future SARS: a puzzling and difficult new disease SARS is the first severe and readily trans- missible new disease to emerge in the 21st century. Though much about the disease remains poorly understood and frankly puzzling, SARS has shown a clear capacity for spread along the routes of internation- al air travel. At present, the outbreaks of greatest concern are concentrated in trans- portation hubs or spreading in densely populated areas. WHO regards every coun- try with an international airport, or border- ing an area having recent local transmis- sion, as at potential risk of an outbreak. The first cases of SARS are now known to have emerged in mid-November 2002 in Guangdong Province, China. The first official report of an outbreak of atypical pneumonia in the province, said to have affected 305 persons and caused 5 deaths, was received by WHO on 11 February. Around 30% of cases were reported to occur in health care workers. Confirmation that cases were consistent with the defi- nition of SARS was made after permission was granted, on 2 April, for a WHO team to visit the province. In the meantime, SARS was carried out of Guangdong Province on 21 February by an infected medical doctor who had treated patients in his home town. He brought the virus to the ninth floor of a four-star hotel in Hong Kong. Days later, guests and visi- tors to the hotel’s ninth floor had seeded outbreaks of cases in the hospital systems of Hong Kong, Viet Nam, and Singapore. Simultaneously, the disease began spread- ing around the world along international air travel routes as guests at the hotel flew home to Toronto and elsewhere, and as other medical doctors who had treated the earliest cases in Viet Nam and Singapore travelled internationally for medical or other reasons. When the disease moved out of southern China, the outbreaks it seeded — in Hanoi, Hong Kong, Singapore, and Toronto — became the initial “hot zones” of SARS, characterized by rapid increases in the number of cases, especially in health care workers and their close contacts. In these areas, SARS first took root in hospital settings, where staff, unaware that a new disease had surfaced and fighting to save the lives of patients, exposed themselves to the infectious agent without barrier pro- tection. All of these initial outbreaks were subsequently characterized by chains of secondary transmission outside the health care environment. By 15 March, WHO had received reports of more than 150 cases of a new disease, which it named severe acute respiratory syndrome. Epidemiological analysis indi- cated that the new disease was spreading along the routes of international air travel. WHO immediately issued emergency travel recommendations to alert health authori- ties, physicians, and the travelling public to what was now perceived to be a worldwide threat to health. The global alert achieved its purpose. After the recommendations, all countries with imported cases, with the exception of provinces in China, were able, through prompt detection of cases, imme- diate isolation, strict infection control, and vigorous contact tracing, to either prevent Page 4 4 further transmission or keep the number of additional cases very low. During the last week of April, the out- breaks in Hanoi, Hong Kong, Singapore, and Toronto showed some signs of peak- ing. On 28 April, Viet Nam became the first country to stop local transmission of SARS. However, new probable cases, including cases in hospital staff, additional deaths, and first cases imported to new areas continued to be reported from several countries. The cumulative total number of cases surpassed 5,000 on 28 April, 6,000 on 2 May, and 7,000 on 8 May, when cases were reported from 30 countries on six continents. At present, most new cases are being reported from Beijing and, increas- ingly, other parts of mainland China. Of the cumulative global total of 7761 probable cases and 623 deaths reported on 17 May, 5209 cases and 282 deaths had occurred in mainland China. Also of concern is a rapidly growing outbreak in Taiwan, China, with a cumulative total, on 18 May, of 344 cases, including many in hospital staff, and 40 deaths. [End excerpt] Later, it was discovered that the virus arose from exposure to and between wild animals in wet markets in Guangdong. China has experienced rapid urbanization and industrialization in recent decades, leading to the formation of a young, wealthy class. The new class seeks to eat exotic wild animals, which has encouraged the growth of wet markets where live animals are kept and sold. China has less wild expanse close to the city in which to hunt so many people hunt animals in Thailand and other countries. Many different animals who would stay far away from each other in the wild are kept in very close contact in transit and at these markets. It is hypothesized that SARS originated in horseshoe bats and jumped to other animals nearby, particularly palm civets, a type of wild cat. Because people who sell their catches at the wet markets also live there, the virus has the opportunity to jump from animal to animal to humans. SARS spread to Toronto in late February 2003, prompting the WHO to issue a global alert on March 12 and elevate the alert on March 15. The events in Toronto clearly demonstrate issues regarding protections for healthcare workers and isolation precautions in an emerging disease event. Excerpt below from: Learning from SARS: Preparing for the Next Disease Outbreak Phase I of the Toronto SARS Outbreak The index case and her husband had vacationed in Hong Kong and had stayed at a hotel in Kowloon from February 18 to 21, 2003. The index case began to experience symptoms after her return on February 23 and died at home on March 5. During her illness, family members, including her son (case A), provided care at home. Case A became ill on February 27 and presented to the index hospital on March 7 (Varia et al., 2003). Nosocomial transmission in the hospital began when case A presented to the emer- gency department on March 7 with severe respiratory symptoms. He was placed in a general observation area of the emergency department and received nebulized salbu- tamol. During this time, SARS was trans- mitted to two other patients in the emer- gency department (cases B and C). Case B, who had presented with rapid atrial fibrillation, was in the bed adjacent to case A, about 1.5 meters away and separated by a curtain, and was discharged home after 9 hours in the emergency department. Case C, who had presented with shortness of breath secondary to a pleural effusion, was three beds (about 5 meters) away from case A and was transferred to a hos- pital ward and later discharged home on March 10. The three patients were cared for by the same nurse. Case A was transferred briefly to a medical unit, then to the intensive care unit (ICU) 18 hours after his presentation to the emer- gency department. Three hours later, he was placed in airborne isolation because tuberculosis was included in his differential diagnosis. Contact and droplet precau- tions were implemented on March 10 by ICU staff caring for case A, and the patient remained in isolation until his death, on March 13. Case A’s family visited him in the ICU on March 8, 9, and 10. During this time, some family members were febrile, and two were experiencing respiratory symp- toms. Chest radiographs were taken of the family members on March 9 and again on March 11. Four members had abnormal radiographs and were instructed to wear masks at all times, wash their hands upon entering and leaving the ICU, and limit their visits to the ICU. Page 5 5 On March 12, the WHO alerted the global community to a severe respiratory syn- drome that was spreading among HCWs in Hanoi, Vietnam, and Hong Kong. The alert was forwarded to infectious disease and emergency department physicians in Toronto. The following day, case A died and it became clear that several other family members had worsening illness. The clinicians involved and the local public health unit suspected the family’s illness- es might be linked to cases of atypical pneumonia reported in Hong Kong. Four family members were admitted to three different hospitals on March 13, and anoth- er family member was admitted to hospi- tal on March 14. All were managed using airborne, droplet, and contact precautions. No further transmission from these cases occurred after admission to hospital. Case B became febrile on March 10, 3 days after exposure to case A in the emergency department and discharge home. Respi- ratory symptoms evolved over the next 5 days. He was brought to the index hospital on March 16 by two Emergency Medical Services paramedics, who did not immedi- ately use contact and droplet precautions. After 9 hours in the emergency depart- ment, where airborne, contact and droplet precautions were used, case B was trans- ferred to an isolation room in the ICU. His wife became ill on March 16. She was in the emergency department with case B on March 16 (no precautions used) and visited him in the ICU on March 21 (precautions used); he died later that day. The infection also spread to three other members of case B’s family. SARS developed in a num- ber of people who were in contact with case B and his wife on March 16, including the 2 paramedics who brought him to the hospital, a firefighter, 5 emergency department staff, 1 other hospital staff, 2 patients in the emergency department, 1 housekeeper who worked in the emergency department while case B was there, and 7 visitors who were also in the emergency department at the same time as case B (symptom onset March 19 to 26). The 16 hospital staff, visitors, and patients trans- mitted the infection to 8 household mem- bers and 8 other family contacts. In the ICU, intubation for mechanical ventilation of case B was performed by a physician wearing a surgical mask, gown and gloves. He subsequently acquired SARS and transmitted the infection to a member of his family. Three ICU nurses who were present at the intubation and who used droplet and contact precautions had onset of early symptoms between March 18 and 20. One transmitted the infection to a household member. Case C became ill on March 13 with symptoms of a myocardial infarction and was brought to the index hospital by paramedics. It was unknown that he had been in contact with case A on March 7, and thus it was not recognized that he had SARS. As a result, he was not isolated, and other precautions were not used. He was admitted to the coronary care unit (CCU) for 3 days and then trans- ferred to another hospital for renal dialysis. He remained in the other hospital until his death, on March 29. Subsequent transmis- sion of SARS occurred within that hospital (Dwosh et al., 2003). Case C’s wife became ill on March 26. At the index hospital, case C transmitted SARS to 1 patient in the emergency department, 3 emergency department staff, 1 housekeeper who worked in the emergency department while case C was there, 1 physician, 2 hos- pital technologists, 2 CCU, patients, and 7 CCU staff. One of the paramedics who transported case C to the index hospital also became ill. Further transmission then occurred from ill staff at the index hospital to 6 of their family members, 1 patient, 1 medical clinic staff, and 1 other nurse in the emergency department. On March 23, 2003, officials recognized that the number of available negative pres- sure rooms in Toronto was being exhaust- ed. In a 4-hour period on the afternoon of March 23, staff at West Park Hospital, a chronic care facility in the city, recom- missioned 25 beds in an unused building formerly used to house patients with tuberculosis. Despite the efforts of West Park physicians and nurses, and assistance from staff at the Scarborough Grace and Mount Sinai Hospitals, qualified staff could be found to care for only 14 patients. Faced with increasing transmission, the Ontario government designated SARS as Page 6 a reportable, communicable, and virulent disease under the Health Protection and Promotion Act on March 25, 2003. This move gave public health officials the authority to track infected people, and issue orders preventing them from engag- ing in activities that might transmit the new disease. Provincial public health activated its emergency operations center. By the evening of March 26, 2003, the West Park unit and all available negative pressure rooms in Toronto hospitals were full; however, 10 ill Scarborough Hospital staff needing admissions were waiting in the emergency department, and others who were ill were waiting at home to be seen. Overnight, with the declaration of a provincial emergency, the Ontario govern- ment required all hospitals to create units to care for SARS patients. By March 25, 2003, Health Canada was reporting 19 cases of SARS in Canada — 18 in Ontario and the single case in Van- couver. But 48 patients with a presumptive diagnosis of SARS had in fact been admitted to hospital by the end of that day. Many more individuals were starting to feel symptoms, and would subsequently be identified as SARS patients. Epidem- ic curves later showed that this period was the peak of the outbreak. On March 19, nine Canadians developed “probable” SARS, the highest single-day total. Taking “suspect” and “probable” cases together, the peak was March 26, and the 3 days, March 25 to 27 are the highest 3-day period in the outbreak. The Ontario government declared SARS a provincial emergency on March 26, 2003. Under the Emergency Management Act, the government has the power to direct and control local governments and facili- ties to ensure that necessary services are provided. All hospitals in the Greater Toronto Area (GTA) and Simcoe County were ordered to activate their “Code Orange” emergency plans by the government. “Code Orange” meant that the involved hospitals suspend- ed nonessential services. They were also required to limit visitors, create isolation units for potential SARS patients, and implement protective clothing for exposed staff (i.e., gowns, masks, and goggles). Four days later, provincial officials extended access restrictions to all Ontario hospitals. On May 14, 2003, WHO removed Toron- to from the list of areas with recent local transmission. This was widely understood to mean that the outbreak had come to an end. Consistent with the notion that the disease was contained, the government of Ontario lifted the emergency on May 17. Directives continued to reinforce the need for enhanced infection control practices in health care settings. Code Orange status for hospitals was revoked. It appeared that the total number of cases had reached a plateau — 140 probable and 178 suspect infections. Twenty-four Cana- dians had died, all in Ontario. [End of excerpt] In mid-May of 2003, after hospitals had discontin- ued SARS precautions, five patients in a Toronto rehabilitation hospital reported with febrile illness. Two of these patients were found to have been hospitalized at North York General Hospital, where a subsequent investigation of pneumonia cases identified eight previously unrecognized SARS cases. The first patient in this second transmis- sion apparently had no history of contact with a SARS patient or healthcare worker with SARS. The hospital was closed to new admissions on May 23, and infection control directives increased required protections. The second transmission of SARS in Toronto came to an end in June with 79 new SARS cases. Guangdong Province, China NOV. 2002 Toronto, Canada FEB. 2003 Page 7 7 [Excerpt continued] Transmission The SCoV has been isolated in sputum, nasal secretions, serum, feces, and bronchi- al washings (Drosten et al., 2003; Peiris et al., 2003b). Evidence suggests that SCoV is transmitted via contact and/or droplets (Peiris et al., 2003a; Poutanen et al., 2003) and that the use of any mask (surgical or N95) significantly decreases the risk of infection (Seto et al., 2003). However, there are cases that defy explanation based on these modes of transmission suggesting that alternative modes of transmission may also occur (Varia et al., 2003). SCoV remains viable in feces for days and the outbreak at the Amoy Gardens apartments highlights the possibility of an oral-fecal or fecal-droplet mode of transmission (WHO, 2003m,n). A number of cases occurred in HCWs wearing protective equipment following exposure to high risk aerosol- and drop- let-generating procedures such as airway manipulation, administration of aerosolized medications, noninvasive positive pressure ventilation, and bronchoscopy or intuba- tion (Lee et al., 2003; Ofner et al., 2003). When intubation is necessary, measures should be taken to reduce unnecessary exposure to health care workers, includ- ing reducing the number of health care workers present and adequately sedating or paralyzing the patient to reduce cough. Updated interim infection control pre- cautions for patients who have SARS are under development and will be available from CDC at http://www.cdc.gov/ncidod/ sars/index.htm. Currently, epidemiological evidence sug- gests that transmission does not occur prior to the onset of symptoms or after symptom resolution. Despite this, shedding of SCoV in stool has been documented by reverse-transcription polymerase chain reaction (RT-PCR) for up to 64 days fol- lowing the resolution of symptoms (Ren et al., 2003). A small group of patients appear to be highly infectious and have been referred to as superspreaders (CDC, 2003a). Such superspreaders appear to have played an important role early in the epidemic but the reason for their enhanced infectivity remains unclear. Possible explanations for their enhanced infectivity include the lack of early implementation of infection control precautions, higher load of SCoV, or larger amounts of respiratory secretions. [End of excerpt] The spread of SARS in Toronto was exacerbated due to delayed public health authority action in recognizing the outbreak, declaring an emergency, and tracing and isolating contacts. The complete lack of protections provided to healthcare work- ers and the late use of precautionary isolation of potential cases presenting with respiratory illness meant that many healthcare workers became infected and continued to infect others before they sickened. Note in the section discussing transmission, no description is given of the type of personal protective equipment (PPE) that healthcare workers wore during the high risk aerosol-generating procedures. Clearly, it was not protective enough. The outbreak was successfully contained after measures were taken to isolate cases and provide protection for healthcare workers. The outbreak in Toronto extended into the second phase because of the lack of integration of new information about SARS. Eight pneumonia cases were later identified as SARS cases, only after patients had had contact with others. Page 8 8 URBANIZATION AND SARS The pace of urbanization has increased **significantly** in the last century. Only 20% of the world’s pop- ulation lived in cities about 100 years ago. Trends towards urbanization are expected to increase in all countries from 45% in 1995 to 61% in 2030. Urban infrastructure has **lagged** behind and many cities host dense regions of people living in crowd- ed **slums**, with limited fresh water, sanitation, and **healthcare access**. The United Nations (UN) pre- dicts that “slums will become the dominant urban form within the next 15 years.” People living in these slums do and will continue to be dispropor- tionately affected by **infectious diseases** through more exposure to **pathogens** and **vectors** and less **availability of healthcare** and prophylaxis than their wealthier counterparts. The destruction of environment to create cities and even in rural areas increases the **contact between humans and animals**. This can accelerate the introduction of **new zoonotic diseases**, like SARS, into humans. More than 60% of the 335 emerging infectious diseases identified between 1940 and 2004 have been zoonotic. Living in close contact with wild or domesticated animals, hunting, killing, or preparing food can be risk factors for an emerging disease to jump species to humans. Close contact between bats and primates in particular is thought to be a significant risk factor. This kind of new and close contact between different species was seen in China’s wet markets where SARS emerged. Food handlers at the wet market in Guangdong were found to be disproportionately affected by SARS early in the epidemic. Urbanization of China forced hunters to travel to new places, bringing different animals back to small areas in wet mar- kets waiting for sale. A key fact to dealing with the SARS epidemic was recognizing that a significant proportion of the initial illnesses occurred in food handlers catching, selling, and killing wild animals. Understanding how diseases are introduced into the population is critical to controlling ongoing epidemics and to preventing outbreaks from progressing to epidemics. GLOBALIZATION AND SARS The spread of SARS from Singapore and Hong Kong to Toronto served as a wake-up call for many about how connected the world had become. Historically, infectious disease outbreaks were geographically confined. International shipping transported some diseases like cholera and the technological developments of the Industrial Revolution like the steam engine and the railroad allowed diseases to be transported more quickly. International **airplane travel** significantly **decreased the amount of time it takes** to get from one place to another, allowing not-yet-symptom- atic people **incubating a disease** to **travel to a new place** before they even know they are sick. Inter- national tourist arrivals have exploded from 25 million in 1950 to more than one billion in 2013. Author Sonia Shah chronicles the development of several different infectious diseases over the past two centuries. In her book, Pandemic: Tracking Contagions, from Cholera to Ebola and Beyond, she describes the effect of increased global travel: [People] don’t just fly in and out of a hand- ful of prominent airports in major cities, but into and out of tens of thousands of airports in small towns and minor cities in even the most remote and far-flung nations. There are some fifteen thousand airports in the United States, but not only that: there are also more than two hundred in the Democratic Republic of Congo, one hundred in Thailand, and, as of 2013, nearly five hundred in China. New York City is no longer the center of today’s global trans- portation network, of course. The hub has shifted. Of the ten largest and busiest air- ports in the world, nine are in Asia, seven in China alone. And just as the United States’ gateway to the world was once New York City, China’s gateway to the world is Hong Kong, where more cargo — both visible and invisible — is loaded onto airplanes than anywhere else. Increased globalization enabled the spread of SARS to Toronto from China and later we will see how globalization contributes to other epidemics. A globalized, integrated public health system is needed to protect all people’s health in our inter- connected, modern world. Page 9 9 [ SECTION II ] ZIKA: AN EMERGING EPIDEMIC IN PROGRESS Note: The info on Zika is current as of the time of writing. As it is an ongoing epidemic, new informa- tion may emerge in the coming months. Zika virus is a positive sense, single-stranded RNA virus in the same family of mosquito-borne arbo- viruses as yellow fever, dengue, West Nile virus, and encephalitis. Zika virus was first isolated in 1947 during surveillance of diseases in macaques in Uganda. The first documented human infection was in 1954, and the virus spread slowly through sub-Saharan Africa to Asia by the 21st century. Outbreaks of Zika have been identified only in recent years: Yap Island in the Federated States of Micronesia in 2007, French Polynesia in 2013, and Brazil spreading to other parts of Latin America in 2015-16. Information about Zika virus is limited including symptoms, length of viremia, transmission, and potential neurological complications. A signifi- cant amount of data has become available during the 2013 and 2015-16 epidemics. Prior to the first recorded outbreak in 2009, only 25 papers were published in peer-reviewed literature compared to 225 in the first three months of 2016 alone. How- ever, few definitive answers have been reached. Zika virus has shown an extremely unusual propensity for multiple transmission pathways. Initially, it was thought that Zika was transmitted only by mosquitoes from human to human and possibly monkey to human. Now, there is evidence that Zika is sexually transmitted, transmitted through blood transfusions, and from a mother to her baby during pregnancy and birth. Additionally, there is one case where Zika was transmitted through bodily fluids from a patient with extreme- ly high levels of Zika virus in his body. Zika virus has been found in various bodily fluids, including saliva, urine, breast milk, the female genital tract, and semen. Viral particles appear to remain in semen for at least 90 days and the female genital tract for at least 14 days. Mosquito-borne transmission of Zika virus con- tinues to be the pathway of most concern in stopping the epidemic. Aedes mosquitoes have adapted to live near humans, requiring only the smallest amount of still water to reproduce. They are active and biting during the day, unlike other mosquito species that only feed at night. In the United States, the Aedes mosquitoes were nearly eradicated in the 1970’s through pesticide appli- cation, but they have made comebacks in some areas after pesticide use has declined or ceased. Urban poverty in Brazil has created “the perfect set of conditions for the transmission of such mosquito-borne viruses.” The lack of infrastructure and water security in conjunction with crowding and poor housing conditions has created a situ- ation where an abundance of breeding grounds exists in close proximity to living quarters where residents also have limited access to prevention like bug spray and air conditioning as well as limited healthcare access. These same conditions exist in many places in the United States that are vulnerable to mosquito-borne disease outbreaks, including Florida, Texas, and other Gulf Coast states. While the Aedes species is the confirmed Zika vector, some suspect other species may have adapted to carry Zika virus, which would help explain the sudden widespread nature of the Brazil outbreak as compared to previous progression of the disease. Global travel has also accelerated the spread of Zika virus. Symptoms of Zika virus infection are typically mild and self-limiting and include fever, itchy maculo- papular rash, joint paint, and conjunctivitis. The case definition of Zika virus disease has evolved during the 2015-16 epidemic from two symptoms with exposure to just one symptom with exposure. Symptoms last a few days to a week; severe illness and death are rare. The incubation period is esti- mated to be between three and twelve days. Up to 80% of people infected with the virus have no symptoms. When diagnostic assays are of limited availability as they have been in the Zika epidemic, establish- ing reliable and consistent case definition is crucial for treatment and prevention of further spread. Fever Conjunctivitis Rash Joint Pain Only 1 out of 5 people develop symptoms Page 10 10 ZIKA: INFORMATION EVOLVES DURING EPIDEMICS The most recent two outbreaks in French Poly- nesia and Brazil have brought to light potential neurological complications geographically and temporally associated with Zika virus infections. The 2013 outbreak in French Polynesia was accompanied by a “concomitant epidemic of 73 cases of Guillain-Barré syndrome and other neuro- logical conditions in a population of approximately 270,000.” Guillain-Barré Syndrome (GBS) is a rare auto-immune disorder that results in damaged nerve cells, weakened muscles, and paralysis. Most people recover from GBS, but some suffer perma- nent damage or death. The most recent outbreak that began in Brazil in 2015 has been accompanied by “an apparent 20-fold increase in incidence from 2014 to 2015” in microcephaly rates. Microceph- aly (head smaller than average) has been seen in infants born to women infected with Zika virus during pregnancy and is related to developmental delay, intellectual disability, vision problems, and other effects. CLIMATE CHANGE AND ARBOVIRUSES The rapid spread of **Zika** through Latin Ameri- can countries should serve as an exposition of the disastrous effects of **climate change** and the interactive effect with **poverty on infectious disease**. Climate change has been influencing **weather patterns** all over the globe, making them less predictable and weather more severe. The 2015 El Niño, “which is characterized by warming waters in the central and eastern Pacific Ocean,” has brought “warmer temperatures and shifting precipitation patterns to South America and can create conditions that help mosquito populations, and the diseases they can transmit, thrive.” Mas- sive flooding in parts of Uruguay, southern Brazil, and Paraguay in recent months has displaced 150,000 people and led to standing water, provid- ing breeding ground for mosquitoes and disrupted living situations and access to healthcare, water, and other vital services. On the other hand, north- ern Brazil, Venezuela, Guyana, and Suriname have had drier than usual weather. Because these areas lack a consistent water supply, many people have begun stockpiling water, creating mosquito breed- ing grounds near human dwellings. Additionally, 2015 was the hottest year on record; these warmer temperatures may mean mosquitoes are more active, reproducing more, and biting more there- fore infecting more people. Diseases carried by mosquitoes are particularly sensitive to meteorological conditions — warmer temperatures increase mosquito reproduction and biting activity and the rate at which pathogens mature inside them. Temperature also limits the range of mosquito vectors. Freezing kills Aedes larvae and eggs. As the earth warms, fewer plac- es will freeze over completely and Aedes vectors will increase their territory and spread infectious diseases to new places. Fossil evidence from the end of the last Ice Age “demonstrate[s] that rapid, poleward shifts of insects accompanied warming.” POVERTY AND INFECTIOUS DISEASES Many of the areas where Zika has been the biggest problem are also the poorest areas of Brazil. The low quality housing, lacking screens and air conditioning that help prevent exposure to mosquitoes, in addition to no reliable water or waste disposal systems creates situations where breeding grounds abound in urban, crowded areas. Brazil eradicated Aedes mosquitoes in 1958 through coordinated efforts and funding. However, over the years, the mosquitoes have returned and multiplied. Not only do residents in these areas have a higher risk for contracting Zika, they will also experience more challenges if they develop GBS or give birth to a baby with microcephaly. Lack of resources compounds the ramifications of disability. We see similar conditions in the **U**nited **S**tates in areas where Aedes mosquitoes are common, like Florida and Texas. These states have large impov- erished populations, a warm climate, and did not expand Medicaid. Not only are the mosquitoes present, which increases the risk for transmitting the disease from a returning infected traveler, the Page 11 11 housing stock in some areas is dilapidated, missing screens and air conditioning, and trash is abandoned to become breeding grounds for mosquitoes after rainfall. The mortgage foreclo- sure crisis hit Florida especially hard, where many houses remain empty, creating mosquito breeding territory. Further, if people begin to be infected locally and develop GBS or microcephaly, their access to healthcare is extremely limited due to their states’ limitations on Medicaid.

**Thus, because the member nations of the World Trade Organization reducing intellectual property protections for medicines is necessary for ensuring the greatest good for the greatest number of people, I affirm and now am open for cross-examination.**