## 1

#### 1] Interpretation – “Reduce” means to annul.

Black’s Law 90 Black’s Law Dictionary 2ND ED. “Reduce” <https://dictionary.thelaw.com/reduce/> //Elmer

In Scotch law. **To rescind or annul**.

#### That means the Aff has to cancel IP protections in their entirety, they can’t just modify it.

Black’s Law 90 Black’s Law Dictionary 2ND ED. “Annul” <https://thelawdictionary.org/annul/>

//Elmer

**To cancel**; **make void ; destroy.** To annul a judgment or judicial proceeding is to **deprive it of all force and operation**, either a6 initio or prospectively as to future transactions. Wait v. Wait, 4 Barb. (N. Y.) 205; Woodson v. Skinner, 22 Mo. 24; In re Morrow’s Estate, 204 Pa. 484, 54 Atl. 342.

#### 2] Violation – They don’t remove the IP, the Trade Secret still has the same protection under law, it cannot be disclosed unless disclosure is in the public interest – the Aff only shifts who has to prove that NOT the actual protection.

#### 3] Standards –

#### a] Limits – Allowing the Aff’s to deal with the enforcement of IP rather than the actual protection explodes the Topic – Affs can modify court proceedings, specify which courts hear the cases, how long those proceedings last, which agencies pursue legal action, etc. – it eviscerates a predictable stasis by shifting it away from IPP good/bad.

#### b] Neg Ground – Shifting the topic to enforcement means DAs like Innovation, Biotech Heg, Politics no longer apply since the Aff doesn’t have to reduce anything related to the IPP itself – proven by the fact we can’t read Trade Secrets Good vs this Aff since the 1AR will shift to the IP itself doesn’t change and if they were good, the Aff wouldn’t be enforced proving modifications are infinitely abusive.

#### 4] TVA – eliminate Trade Secret protection of Pharma to eliminate deterrent litigation against whistle-blowers since there’s no longer a legal basis for enforcement.

#### 5] Paradigm Issues –

#### a] Topicality is Drop the Debater – it’s a fundamental baseline for debate-ability.

#### b] Use Competing Interps – 1] Topicality is a yes/no question, you can’t be reasonably topical and 2] Reasonability invites arbitrary judge intervention and a race to the bottom of questionable argumentation.

#### c] No RVI’s - 1] Forces the 1NC to go all-in on Theory which kills substance education, 2] Encourages Baiting since the 1AC will purposely be abusive, and 3] Illogical – you shouldn’t win for not being abusive.

## 2

#### CP Text: - The European Union ought to

#### increase intellectual property protections for medicines

#### designate intellectual property protections on medicines as adversely affecting the international transfer of technology.

#### The CP competes – 1] it increases IP protections and 2] it’s a temporary waiver NOT a permanent reduction.

#### Member states can waive IP rights if they hamper the international flow of medical technology.

WTO ’21 (World Trade Organization; 2021; “Obligations and exceptions”; World Trade Organization; Accessed: 8-30-2021; exact date not provided, but copyright was updated in 2021; AU)

Article 8 Principles […] 2. Appropriate measures, provided that they are consistent with the provisions of this Agreement, **may be needed** to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or **adversely affect** the **international transfer of technology**. SECTION 8: CONTROL OF ANTI-COMPETITIVE PRACTICES IN CONTRACTUAL LICENCES Article 40 1. Members agree that some licensing practices or conditions pertaining to intellectual property rights which restrain competition may have **adverse effects on trade** and **may impede** the **transfer and dissemination** of technology. 2. Nothing in this Agreement **shall prevent** Members from specifying in their legislation licensing practices or conditions that may in particular cases constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market. As provided above, a Member **may adopt**, consistently with the other provisions of this Agreement, **appropriate measures** to **prevent or control** such practices, which may include for example exclusive grantback conditions, conditions preventing challenges to validity and coercive package licensing, in the light of the relevant laws and regulations of that Member. […]

#### Designating IP protections as antithetical to the global health system revitalizes info-sharing.

Youde ’16 (Jeremy; writer for World Politics Review; 4-29-2016; “Technology **Transfer** Is a **Weak Link** in the Global Health System”; World Politics Review; <https://www.worldpoliticsreview.com/articles/18639/technology-transfer-is-a-weak-link-in-the-global-health-system>; Accessed: 8-30-2021; AU)

In mid-April, a spokesperson for the Ugandan government admitted that the country’s only functioning cancer treatment machine had broken earlier that month. The radiotherapy machine, donated by China to Uganda in 1995 and housed at Mulago Hospital in Kampala, is now considered beyond repair. While the government did acquire a second radiotherapy machine in 2013, it has not been operational because of delays in allocating 30 billion shillings—just shy of $9 million—to construct a new building to house it. The funding delay has lifted, but the machine won’t be up and running for at least six months. The government has announced plans to airlift some cancer patients to Nairobi for treatment, but that plan will only accommodate 400 of the estimated 17,000 to 33,000 cancer patients who need treatment annually in Uganda. This breakdown of technology is a human tragedy for the cancer patients from Uganda as well as elsewhere in East Africa that the radiotherapy machine helped treat. Beyond the personal level, though, the episode illustrates a larger shortcoming in global health. Total annual development assistance for health is approximately $36 billion, but that funding is overwhelmingly concentrated on specific infectious diseases. Noncommunicable diseases like cancer receive relatively little international funding—only 1.3 percent in 2015, and the dollar amount has declined since 2013. Funds to strengthen health systems, geared toward building and supporting a resilient health care system, are similarly low, making up only 7.3 percent of development assistance in 2015. Noncommunicable diseases kill more people every year than infectious diseases and accidents do, but this balance is not reflected in global health spending. ... These shortcomings also speak to larger problems in global health around issues of **technology transfers** and long-term **commitments** to keep that technology working. It’s one thing to provide necessary medical technologies in the first place; it’s another to ensure that those technologies are accessible and operational going forward. Despite the **importance** of technology transfers, questions of **long-term support** for them have received relatively little attention from the global health regime. As noncommunicable diseases like cancer cause an even-higher proportion of deaths each year, it will become all the more **imperative** that the international community address this gap in **sharing** and funding **crucial health care** technology. This does not mean that there are no efforts to facilitate technology transfers around the world. The Fogarty International Center, a part of the U.S. National Institutes of Health, has had an [Office of Technology Transfer](http://www.fic.nih.gov/News/GlobalHealthMatters/march-april-2014/Pages/technology-transfer-nih-ott.aspx) since 1989 to make medical innovations developed in the United States more widely available. The World Health Organization (WHO) also has a [Technology Transfer Initiative](http://www.who.int/phi/programme_technology_transfer/en/) to improve access to health care technologies in developing countries. These efforts are laudable, but their interpretation of technology transfer is almost entirely rooted in access to pharmaceuticals and vaccines. To be sure, that is a very important issue—but it only deals with one narrow element of technology transfer. The problems of global health technology transfers illustrated in Uganda underscore a larger issue: the need for a so-called fourth industrial revolution, what has been described as “blurring the real world with the technological world.” This idea gained prominence earlier this year when it served as the theme for the World Economic Forum in Davos. For global health, this means embracing technology to find low-cost ways to promote health, spread education, and reach communities whose access to the health care infrastructure is weak. It expands on the notion of telemedicine and eHealth to make it more encompassing. According to health care entrepreneur Jonathan Jackson, the fourth industrial revolution could change global health by encouraging a shift in focus “from healthcare to health promotion.” Moving from high-cost treatment to low-cost prevention, he has argued, will have significant and far-reaching positive economic implications for developing countries around the world. Its inspiring sense of technological optimism notwithstanding, this sort of approach cannot be the sole focus of technology transfers in global health. Prevention is indeed important, but the fact of the matter remains that people will get sick—and those sick people will need treatment. Mobile applications and electronic access to health care providers can be useful, but they cannot replace a radiotherapy machine. Understanding the root causes of noncommunicable diseases goes far beyond individual choices and intersects with the larger political, economic and social context, so we cannot assume that cybertechnology alone can stop cancer. It is also important to remember that the results of greater technological innovation and integration won’t be free. Sub-Saharan African states, on average, spend $200 per person per year on health care. Even if technology allows costs to decline, they are still likely to be out of reach for many people in most of these countries—in the same way that the purchase and maintenance of medical technologies are prohibitively expensive in these same states today. Technology in and of itself is not useful unless it can be maintained over the long term. This, then, is a weak link in the larger global health system: How do we ensure access to life-prolonging medical technologies beyond pharmaceuticals and vaccines in a sustainable way? Consider two ideas. First, development assistance for health must orient more of its resources toward treating noncommunicable diseases and strengthening health systems. These are the areas in which these technologies are likely to be used, but are not currently supported by the international system. The changing nature of health and disease will only make them even more important in the years to come. Second, longer-term funding commitments would provide a greater opportunity to incorporate medical technologies into health care systems sustainably. Machines will break down, and technologies will fail. That is inevitable. But the global health regime, from the WHO and its regional organizations like the Regional Office for Africa to major donors like the **U**nited **S**tates government and the Bill and Melinda Gates Foundation, needs to figure out how to ensure that these problems do not put **lives in peril**. Technology alone will not improve global health unless it is properly supported and funded.

#### International collaboration’s key to check future pandemics – otherwise, extinction.

Dulaney ’20 [Michael; digital journalist with the ABC June 2020; "'A question of when, not if': Another pandemic is coming – and sooner than we think", No Publication; https://www.abc.net.au/news/science/2020-06-07/a-matter-of-when-not-if-the-next-pandemic-is-around-the-corner/12313372, accessed 4-12-2021]

And as recently as September last year — just a few months before COVID-19 was detected in China — an independent watchdog set up by the WHO warned the world was "grossly" unprepared for the "very real threat" of a pandemic. But even more alarming is what the new coronavirus indicates about the future. Researchers say human impacts on the natural world are causing new infectious diseases to emerge more frequently than ever before, meaning the next pandemic — one perhaps even worse than COVID-19 — is only a matter of time. "We know that it's a probability, not a possibility," Dr Reid says. "The roulette wheel will start to spin again. "If you don't resolve the conditions that generated the problem, then we sit waiting for the next probability equation to come through. "And it will, and sadly it's possible that it's in our lifetime." The growing threat to human health Nearly all emerging pathogens like COVID-19 come from "zoonotic transfer" — essentially, when a virus present in animals jumps to infect humans. The US Centers for Disease Control and Prevention estimates three out of every four new infectious diseases, and nearly all pandemics, emerge this way. Researchers have counted around 200 infectious diseases that have broken out more than 12,000 times over the past three decades. On average, one new infectious disease jumps to humans every four months. Animal species like civet cats (SARS), camels (MERS), horses (Hendra), pigs (Nipah) and chimpanzees (HIV) have all been implicated in the spread of new viruses at different times.

#### The CP solves and the plan doesn’t – waivers a key so that patents are added to the technology transfer hub created by the WHO. Absent TRIPS waivers in particular, all the necessary information for info-sharing isn’t passed on.

Ito ’21 (Banri; Professor of Economics at Aoyama Gakuin University, and RIETI Fellow; “Impacts of the vaccine intellectual property rights waiver on global supply”; CEPR; <https://voxeu.org/article/impacts-vaccine-intellectual-property-rights-waiver-global-supply>; Accessed: 8-31-2021; AU)

With respect to the COVID-19 vaccines developed by Pfizer (jointly with BioNTech of Germany) and Moderna, it appears that the whole body of relevant technical knowledge has **not necessarily been patented** but that some of the technical knowledge remains undisclosed as trade secrets. Patenting is only one means of ensuring ‘appropriability’, which refers to a company's capacity to secure profits from its own technological innovation. While patent information may make it possible for outsiders to achieve development results similar to those achieved by the patented technology through a similar method without infringing the patent right, keeping the technology **undisclosed** as a **trade secret** or incorporating complex processes into it may be an effective means of ensuring appropriability. Pharmaceuticals can easily be counterfeited through ‘reverse engineering’, which refers to a process in which the active ingredients of a drug are identified as a result of deformulation. Therefore, as a general rule, it is considered important to exclude the risk of counterfeiting through patenting. While it is not clear how much of the relevant technological knowledge remains unpatented, there are apparently some technical reasons for not obtaining full patent protection. The Pfizer and Moderna vaccines use advanced technology based on messenger RNA (mRNA), representing the first case of practical application of such technology. Although I, a non-expert in this field, will refrain from going into further detail, it is **highly likely** that those vaccines cannot easily be counterfeited as their production requires **complex production processes** and unique technology. Patenting involves public disclosure of technical knowledge, providing information on how to reproduce patented inventions. It has the function of lowering technology trade costs by clarifying property rights on technical knowledge. If the technical knowledge necessary for manufacturing a certain product remains **undisclosed as a trade secret**, it may not be recorded in a written or other tangible form, and it may become **necessary** to pass down the technical information as cumulative implicit knowledge. As a result, technology transfer may become difficult. Perhaps **in view of that risk**, in April 2021, the World Health Organization (**WHO**) established a COVID-19 vaccine **technology transfer hub** as a scheme to promote the sharing of mRNA-based technology. However, there are no media reports to date indicating that technical knowledge has been provided through this scheme.2 Using data from patent applicants for drugs for the three major infectious diseases (HIV/AIDS, Tuberculosis, and Malaria), we examined the applicants for their corporate attributes and found that pharmaceutical companies that cover various disease fields have an advantage in drug development for infectious diseases (Ito and Yamagata, 2007). In the case of drug development, economies of scope may be effective. In fact, there have been many reports of drug repurposing due to similarities in the therapeutic drugs for COVID-19, and it seems that drugs used to treat a wide range of conditions may be applicable to COVID-19 treatment, with those drugs not being limited to known treatments for infectious diseases. Given the ‘economies of scope’ entailed in the development of pharmaceuticals, mRNA-based advanced technology may become applicable to other common diseases in the future. The scope of the proposed **TRIPS waiver** under discussion at the WTO **extends beyond patent protection** to include the protection of industrial designs, copyrights and **undisclosed information**.3 However, even if the waiver of the TRIPS agreement is applied to the Pfizer and Moderna vaccines, it remains unclear for the moment how much of the undisclosed information regarding unpatented elements will be disclosed in order to facilitate technology transfer to developing countries. Will equitable vaccine supply be realised? If technical knowledge regarding patented vaccines is disclosed and if it becomes possible to produce the vaccines in third-party countries, as a general rule, a supply increase would bring benefits to consumers as the elimination of a monopoly lowers prices. Among past cases, we should look at the application of the waiver of the WTO TRIPS agreement to drugs to treat HIV/AIDS in 2001. According to an estimate by Médecins Sans Frontière, the prices of patented drugs dropped to less than a tenth of the previous level in one year, improving access to the drugs around the world.4 Given that the principle of competition works, access to the COVID-19 vaccines is expected to improve.

#### CP solves the Aff – 1] Solves Advantage 1 – it’s a signal to whistle-blowers that the government is fully on-board with curbing trade secretes and 2] Solves Advantage 2 – it effects the entire EU and standardizes protections.

## 3

#### Trade Secrets are key to incentivize competitive Innovation – specifically key to protect start-ups.

Gutfleisch 18, Georg. "Employment issues under the European Trade Secrets Directive: Promising opportunity or burden for European companies." European Company Law Journal 15 (2018): 175-181. (working as an Associate with Brandl & Talos Rechtsanwälte GmbH in Vienna, Austria, and recently studied in the LL.M. (International and European Business Law) program at Trinity College Dublin, Ireland.)//Elmer

The **protection of trade secrets** can be **considered** as a **prerequisite for the continuous growth and success of European companies as well as the** general (**technological) advancement and competitiveness of the European economy**.7 Trade secrets can basically be described as secret information that is of value for its owner because of its secrecy. Trade secrets must be differentiated from other (registered) intellectual property rights, such as patents, designs or trademarks. They are not publicly registered and do not grant the trade secret owner an exclusive right against third parties. Most legal systems rank trade secret protection as part of unfair-competition law rather than intellectual property law.8 However, trade secrets are nevertheless related to intellectual property rights. In particular, they could be considered as a **preliminary** step or by-product **to** the **i**ntellectual **p**roperty rights **creation**. Further, trade secrets could also be maintained as permanent alternative to (registered) intellectual property rights. They do not involve costs for the application or subsequent prolongations with the competent authorities and do not impose risks of disclosure during such proceedings.9 Especially **small- and medium-sized enterprises** and start-ups **in** the **research and engineering** business often **rely on the confidentiality of sensitive information as basis of their existence**.10 The **importance** **of** effective **trade secret protection** has been **acknowledged by lawmakers globally.** Back in 1994, the member states of the World Trade Organisation (WTO) entered into the international Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement),11 which mandates the WTO member states to ensure the protection of undisclosed information without consent in a manner contrary to honest commercial practices. In addition, the Paris Convention on the protection of industrial property of 20 March 1883 (CUP Agreement)12 provides another international legal framework, which some scholars argue does afford protection to trade secrets.13 However, the rather vague minimum requirements of the TRIPS Agreement and the CUP Agreement resulted in significant differences in the national levels of trade secret protection, especially within the member states of the European Union (EU).14 The European Commission acknowledged this situation and started to actively engage with the issue of trade secret protection in the EU. In November 2013, the European Commission introduced its proposal for the TSD (together with an impact assessment and implementation plan).15 The TSD was then enacted in June 2016 after further input from the European Economic and Social Committee16 and the European Parliament Committee on Legal Affairs.17 The TSD has been based on two main reasons.18 On the one hand, it has been argued that the different levels of protection in Europe caused companies to refrain from exchanging confidential information across borders and hindered the proper development of research and innovation. On the other hand, **European companies** regularly **faced** **competitive disadvantages when their trade secrets are misappropriated**.

#### Yes Link – the thesis of the Aff is mean to help ease burden of whistleblowers in winning suits to expose Trade Secrets – the mere threat of a weakening IPR and Secret Protection deters investment.

Ezell et al. ’19 (Stephen; vice president of global innovation policy at the Information Technology and Innovation Foundation; 4-25-2019; “The Way Forward for Intellectual Property Internationally”; Information Technology and Innovation Foundation; <https://itif.org/publications/2019/04/25/way-forward-intellectual-property-internationally>; Accessed: 8-31-2021; AU)

**IPR** reforms also introduce **strong incentives** for domestic innovation. Sherwood, using case studies from 18 developing countries, concluded that **poor provision** of intellectual property rights **deters local innovation** and risk-taking.47 In contrast, IPR reform has been associated with **increased innovative activity**, as measured by domestic patent filings, albeit with some variation across countries and sectors.48 For example, Ryan, in a study of biomedical innovations and patent reform in Brazil, found that patents provided incentives for innovation investments and facilitated the functioning of technology markets.49 Park and Lippoldt also observed that the provision of adequate **protection for IPRs** can help to **stimulate** local innovation, in some cases building on the transfer of technologies that provide inputs and spillovers.50 In other words, local innovators are introduced to technologies first through the technology transfer that takes place in an environment wherein **protection** of IPRs is **assured**; then, they may build on those ideas to create an evolved product or develop alternate approaches (i.e., to innovate). Related research finds that trade in technology—through channels including imports, foreign direct investment, and technology licensing—improves the quality of developing-country innovation by increasing the pool of ideas and efficiency of innovation by encouraging the division of innovative labor and specialization.51 However, Maskus notes that **without protection** from potential abuse of their newly developed technologies, foreign enterprises may be less willing to reveal technical information associated with their innovations.52 The protection of **patents and trade secrets** provides **necessary legal assurances** for firms wishing to reveal proprietary characteristics of technologies to subsidiaries and licensees via contracts. The relationship between IPR rights and innovation can also be seen in studies of how the introduction of stronger IPR laws, with regard to patents, copyrights, and trademarks, affect R&D activity in an economy. Studies by Varsakelis and by Kanwar and Evenson found that R&D to GDP ratios are positively related to the strength of patent rights, and are conditional on other factors.53 Cavazos Cepeda et al. found a **positive influence** of IPRs on the level of R&D in an economy, with each 1 percent increase in the level of protection of IPRs in an economy (as measured by improvements to a country’s score in the Patent Rights Index) equating to, on average, a 0.7 percent increase in the domestic level of R&D.54 Likewise, a 1 percent increase in copyright protection was associated with a 3.3 percent increase in domestic R&D. Similarly, when trademark protection increased by 1 percent, there was an associated R&D increase of 1.4 percent. As the authors concluded, “Increases in the protection of the IPRs carried **economic benefits** in the form of higher inflows of FDI, and increases in the levels of both domestically conducted R&D and service imports as measured by licensing fees.”55 As Jackson summarized, regarding the relationship between IPR reform and both innovation and R&D, and FDI, “In addition to spurring domestic innovation, strong intellectual property rights can increase incentives for foreign direct investment which in turn also leads to economic growth.”56

#### Pharma innovation solves Pandemics, ABR, and Bioterrorism – only Private Firms have the ability for preparedness and reaction.

Marjanovic and Feijao 20 Sonja Marjanovic and Carolina Feijao May 2020 "Pharmaceutical Innovation for Infectious Disease Management" <https://www.rand.org/content/dam/rand/pubs/perspectives/PEA400/PEA407-1/RAND_PEA407-1.pdf> (directs RAND Europe's portfolio of research in the field of healthcare innovation, industry and policy)//Re-cut by Elmer

As key actors in the healthcare innovation landscape, pharmaceutical and life sci-ences companies have been called on to develop medicines, vaccines and diagnostics for pressing public health challenges. The COVID-19 crisis is one such challenge, but there are many others. For example, MERS, SARS, Ebola, Zika and avian and swine flu are also infectious diseases that represent public health threats. **Infectious agents such as** **anthrax, smallpox and tularemia could** **present threats in** a **bioterrorism** con-text.1 The general **threat to public health** that is posed **by antimicrobial resistance** is also well-recognised as an area in **need of pharmaceutical innovation**. Innovating in response to these challenges does not always align well with pharmaceutical industry commercial models, shareholder expectations and compe-tition within the industry. However, the **expertise, networks and infrastructure** that **industry has** within its reach, as well as public expectations and the moral imperative, **make pharmaceutical companies** and the wider life sciences sector an **indispensable** partner **in** the **search for solutions** that save lives. This perspective argues for the need to establish more sustainable and scalable ways of incentivising pharmaceu-tical innovation in response to infectious disease threats to public health. It considers both past and current examples of efforts to mobilise pharmaceutical innovation in high commercial risk areas, including in the context of current efforts to respond to the COVID-19 pandemic. In global pandemic crises like COVID-19, the urgency and scale of the crisis – as well as the spotlight placed on pharmaceutical companies – mean that contributing to the search for effective medicines, vaccines or diagnostics is essential for socially responsible companies in the sec-tor.2 It is therefore unsurprising that we are seeing indus-try-wide efforts unfold at unprecedented scale and pace. Whereas there is always scope for more activity, industry is currently contributing in a variety of ways. Examples include pharmaceutical companies donating existing com-pounds to assess their utility in the fight against COVID-19; screening existing compound libraries in-house or with partners to see if they can be repurposed; accelerating tri-als for potentially effective medicine or vaccine candidates; and in some cases rapidly accelerating in-house research and development to discover new treatments or vaccine agents and develop diagnostics tests.3,4 Pharmaceutical companies are collaborating with each other in some of these efforts and participating in global R&D partnerships (such as the Innovative Medicines Initiative effort to accel-erate the development of potential therapies for COVID-19) and supporting national efforts to expand diagnosis and testing capacity and ensure affordable and ready access to potential solutions.3,5,6 The primary purpose of such **innovation** is to **benefit** patients and **wider population health**. Although there are also reputational benefits from involvement that can be realised across the industry, there are likely to be rela-tively few companies that are ‘commercial’ winners. Those who might gain substantial revenues will be under pres-sure not to be seen as profiting from the pandemic. In the United Kingdom for example, GSK has stated that it does not expect to profit from its COVID-19 related activities and that any gains will be invested in supporting research and long-term pandemic preparedness, as well as in developing products that would be affordable in the world’s poorest countries.7 Similarly, in the United States AbbVie has waived intellectual property rights for an existing com-bination product that is being tested for therapeutic poten-tial against COVID-19, which would support affordability and allow for a supply of generics.8,9 Johnson & Johnson has stated that its potential vaccine – which is expected to begin trials – will be available on a not-for-profit basis during the pandemic.10 Pharma is mobilising substantial efforts to rise to the COVID-19 challenge at hand. However, we need to consider how pharmaceutical innovation for responding to emerging infectious diseases can best be enabled beyond the current crisis. Many public health threats (including those associated with other **infectious diseases, bioterrorism** agents **and antimicrobial resistance**) are urgently in **need** of **pharmaceutical innovation**, even if their impacts are not as visible to society as COVID-19 is in the imme-diate term. The pharmaceutical industry has responded to previous public health emergencies associated with infec-tious disease in recent times – for example those associated with Ebola and Zika outbreaks.11 However, it has done so to a lesser scale than for COVID-19 and with contribu-tions from fewer companies. Similarly, levels of activity in response to the threat of antimicrobial resistance are still low.12 There are important policy questions as to whether – and how – industry could engage with such public health threats to an even greater extent under improved innova-tion conditions.

#### Bioterrorism and future pandemics cause extinction.

de Bretton-Gordon 20, Hamish. "Biosecurity in the wake of COVID-19: the urgent action needed." (2020). (Director at DBG Defense)//C.VC

Policymakers around the world did not grasp just how large the impact of a bio threat could be. Beyond the enormous human and economic impact, the current pandemic has exposed the weakness, lack of preparedness, and poor responsiveness of healthcare systems of even highly developed countries like the United States and the United Kingdom. And the virus has inflicted carnage, even though SARS-CoV-2 (the virus that causes COVID-19) is not especially virulent. The **world may be confronted with** other **viruses** in the future **whose combination of virulence** (the harm a pathogen does to its host), **transmissibility, and other characteristics pose much greater danger**. While overwhelming evidence points to SARS-CoV-2 spontaneously spreading to humans, the **advances in synthetic biology** and the growth in the number of Level 3 and 4 biocontainment facilities around the world storing deadly viruses1 **mean** there is also the very **real possibility** **that** in the future, **bad actors will** try to **engineer or steal**/obtain **a** **highly transmissible and** highly **virulent** **virus** **and unleash it onto the world**. **Another risk is accidental releases** from such biocontainment facilities. COVID-19, a highly transmissible but not very virulent pathogen, has had a devastating global impact, a fact that will not have gone unnoticed by rogue states and terror organizations. Advances in synthetic biology have created tools that could be put to malevolent use. In the last two decades, scientists synthesized the poliovirus from its genetic sequence,2 recreated the 1918 Spanish flu virus,3 and succeeded in modifying the H5N1 avian flu virus so that it resulted (in a research laboratory) in airborne transmission among mammals.4 In the future, **we should think of weaponized biology as no less of an existential threat to the planet than weaponized atomic science**. It should also be noted that the fear and panic that **even a medium-scale bioterror attack** **could create** could have **dangerous implications** that may rival or even surpass the immediate loss of life. The Need to Rethink Likelihood Given the fact that in late 2019 when, as far as is known, COVID-19 cases first started emerging in China, it had been more than a century since the previous catastrophic outbreak (the 1918-1919 “Spanish flu” pandemic),d it was unsurprising that many thought of such pandemics as a one-in-a-100-year event. Such assumptions should no longer hold. The encroachment of human settlements into areas that had previously been sanctuaries for wildlife5 and the popularity in some parts of the world of markets where people and wild animals are brought into proximity have made it more likely viruses will make the species leap to human beings.e And when they do, as the COVID-19 pandemic illustrated, the **interconnectedness** of a world in which millions of people fly each day6 **means** they can **spread** very **rapidly**. There is also growing concern about engineered viruses. Not only have advances in synthetic biology (SynBio) created growing capacity for extremely dangerous viruses to be engineered in a laboratory, but the **number of people with** access to potentially dangerous ‘**dual use’ technology** has greatly **expanded** and continues to expand, making malevolent use of such technology ever more likely. In the August 2020 issue of this publication, scientists at the U.S. Military Academy at West Point warned that: The wide availability of the protocols, procedures, and techniques necessary to produce and modify living organisms combined with an exponential increase in the availability of genetic data is leading to a revolution in science affecting the threat landscape that can be rivaled only by the development of the atomic bomb. As the technology improves, the level of education and skills necessary to engineer biological agents decreases. Whereas only state actors historically had the resources to develop and employ biological weapons, SynBio is changing the threat paradigm. The cost threshold of engineering viruses is also lowering, with the West Point scientists warning that synthetic biology has “placed the ability to recreate some of the deadliest infectious diseases known well within the grasp of the state-sponsored terrorist and the talented non-state actor.”7 As already noted, another source of vulnerability is that deadly viruses could be stolen from or escape from a research laboratory. There are now around 50 Biosafety Level 4f facilities around the world, where the deadliest pathogens are stored and worked on, and this figure is set to increase in the next few years.g This is a large increase over the last 30 years, creating bigger risk of a breach. Of equal, if not greater concern are the thousands of Biosafety Level 3 labs globally,8 which handle deadly pathogens like COVID-19.9 Given what has been outlined above, the risk of a future destructive biological attack or another devastating global pandemic should no longer be seen as low. From this point forward, **there should no higher priority** for the international community **than biosecurity**.