

AFFIRMATIVE:

In this debate, I affirm the following:

Resolved: The member nations of the World Trade Organization ought to reduce intellectual property protections for medicines.

Value: My value is morality, as implied in the resolution through the word ought

Criteria: My criteria is Rule Utilitarianism which means doing the greatest good for the greatest number of people, without violating the standards set forth by the UDHR (universal declaration of human rights)”

1] Util is a lexical pre-requisite to any other framework: Threats to bodily security and life preclude the ability for moral actors to effectively utilize and act upon other moral theories since they are in a constant state of crisis that inhibit the ideal moral conditions which other theories presuppose – so, util comes first.

2] Use epistemic modesty for evaluating the framework debate: that means compare the probability of the framework times the magnitude of the impact under a framework. This maximizes the probability of achieving net most moral value

3] Default to util if there's any uncertainty

Walter **Sinnott-Armstrong 14** [American philosopher. He specializes in ethics, epistemology, and more recently in neuroethics, the philosophy of law, and the philosophy of cognitive science], "Consequentialism", The Stanford Encyclopedia of Philosophy (Spring 2014 Edition), Edward N. Zalta (ed), BE

Even if consequentialists can accommodate or explain away common moral intuitions, that might seem only to answer objections without yet giving any positive reason to accept consequentialism. However, **most people begin with the presumption that we morally ought to make the world better when we can. The question then is only whether any moral constraints or moral options need to be added to the basic consequentialist factor in moral reasoning.** (Kagan 1989, 1998) If no objection reveals any need for anything beyond consequences, then consequences alone seem to determine what is morally right or wrong, just as consequentialists claim.

4] Extinction comes first under any framework

Pummer 15 [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. "Moral Agreement on Saving the World" Practical Ethics, University of Oxford. May 18, 2015] AT

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we're consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions... upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world. even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there's nothing (apart from effects on existing people)

to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there's a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there's more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don't matter. Even John Rawls wrote, "All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational. crazy." Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They'd thus imply very strong reasons to reduce existential risk, at least when this doesn't significantly involve doing harm to others or damaging one's character. What's even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial "point of view of the universe," indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one's own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don't care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler's recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I'd have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I've just argued that there's agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions... upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It's possible they'll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won't get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: "We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy.... Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly." (From chapter 36 of *On What Matters*)

Definitions: can be provided upon request

WTO:

Tarver 21 - (Evan Tarver - Evan Tarver is an author, editor, and copywriter with a rich and diverse history in finance and technology. He began his career in finance as a financial analyst for a startup firm. Over the years, he has worked as a senior financial analyst, director of finance, and business analyst. Aside from a career in finance, Evan has an extensive writing and editing history, contributing content to various publications and authoring several books and novels, including *The New Earth Trilogy: Trial by Fire, Life in Twenty-Something: A Story of Self-Discovery*, and *The Meaning of the New Rich*. He writes weekly for a blog on self-improvement, esoteric life philosophy, and business.) - "World Trade Organization" - Investopedia - March 1, 2021 - [wto.asp](https://www.investopedia.com/terms/w/wto.asp)

Created in 1995, **the World Trade Organization (WTO) is an international institution that oversees the global trade rules among nations.** It superseded the 1947 [General Agreement on Tariffs and Trade](#) (GATT) created in the wake of World War II. The WTO is based on agreements signed by the majority of the world's trading nations. The main function of the organization is to help producers of goods and services, as well as exporters and importers, protect and manage their businesses. As of 2021, the WTO has 164 member countries, with Liberia and Afghanistan the most recent members, having joined in July 2016, and 25 “observer” countries and governments.

Reduce:

Intellectual Property Protections:

World Intellectual Property Organization - “What Is Intellectual Property” - [en](#)

Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce. **IP is protected in law by, for example, patents, copyright and trademarks,** which enable people to earn recognition or financial benefit from what they invent or create. By striking the right balance between the interests of innovators and the wider public interest, the IP system aims to foster an environment in which creativity and innovation can flourish.

Contention 1: India

A: India is in crisis - the recent COVID surge is fundamentally different from that of the past

Khullar 21. [(Dhruv Khullar is a contributing writer at The New Yorker, where he writes primarily about medicine, health care, and politics. He is also a practicing physician and an assistant professor at Weill Cornell Medical College) “India’s Crisis Marks a New Phase in the Pandemic,” The New Yorker, May 13, 2021.

<https://www.newyorker.com/science/medical-dispatch/indias-crisis-marks-a-new-phase-in-the-pandemic>]

TDI

Laxminarayan’s walks have changed in recent weeks. **Coronavirus deaths in India have skyrocketed**, and a **frightening atmosphere** has descended. New Delhi is roughly as dense as New York City, with some thirty thousand residents per square mile. But now Laxminarayan passes just a few scattered people; almost everyone stays inside if they can, venturing out only in search of food, medication, or medical care. Before the surge, mask-wearing had declined, but now everyone’s face is covered again. “You need public-health enforcement when the pandemic is invisible,”

Laxminarayan told me. “Now fear is the dominant force changing people’s behavior.” Government statistics indicate that the virus is newly infecting millions of Indians each week, and that some twenty thousand or thirty thousand people are dying weekly. But most experts, including Laxminarayan, believe that those numbers **capture a fraction of the true covid-19 toll.** **“It’s a war zone.”** Laxminarayan said. “It’s worse than what you’re reading in the papers or seeing on TV. Whatever the numbers are, they don’t tell the full story. **The human toll is devastating.**” **The current surge differs fundamentally from India’s experience last year.** “This is truly a national wave,” Laxminarayan said. “It’s not urban. It’s not rural. It’s not north or south. It’s everywhere.” He went on, “During the first wave, the poor suffered the bulk of the health and economic toll. Now everyone is affected. I personally don’t know a single family that doesn’t have covid in it right now. I don’t mean in their extended family. I mean in their nuclear family.” In late April, after his dentist’s parents both died and after a colleague fell ill and couldn’t get oxygen, Laxminarayan decided to shift from covid research to covid relief. He and his team at C.D.D.E.P. decided to focus on India’s oxygen-supply problem, which has fundamentally limited the nation’s hospital capacity. They launched an initiative called OxygenForIndia, raising eight and a half million

dollars in two weeks; with the help of corporate partners, among them Verizon Media, Logitech, and UiPath, they have secured more than two thousand oxygen concentrators—portable devices that remove nitrogen from the air to produce purified oxygen—and thirty thousand cylinders to store gaseous oxygen. By some estimates, those cylinder donations add up to more gaseous oxygen than India has received through foreign aid to date. “Right now, no one wants to leave a hospital bed they’re in,” Laxminarayan said. “It’s the only place they know perhaps they can get oxygen. We want to assure people they will have oxygen at home, so that hospital capacity is freed up for the sickest patients.” Laxminarayan thinks that bolstering critical-care capacity is a long-term proposition—“You can’t make doctors and nurses overnight”—and that India is better served today by making more efficient use of its existing infrastructure. OxygenForIndia has already started delivering oxygen to people’s homes, but the organization’s larger goal is to partner with hospitals in urban areas: Delhi, Bangalore, and Kolkata, among others. Doctors, along with algorithms, will triage patients upon presentation or as they improve before discharge. Those deemed safe to go home with supportive oxygen will be given a Q.R. code to be scanned at a nearby warehouse, where they can collect an oxygen cylinder or concentrator to keep as long as they need. (Cylinders must be refilled at the warehouse each day; concentrators can be used continuously at home.) “I’m hoping this is a scalable model that can be used by other countries when they face their big covid wave,” Laxminarayan said. “Because there’s no reason to believe they won’t.” The air around us, which contains twenty-one-per-cent oxygen, must be concentrated and purified to produce the medical-grade gas that people need when the coronavirus besieges their lungs. The most efficient way to accomplish this—the default in wealthy countries—is for factories to produce liquid oxygen, which tanker trucks then deliver to hospitals, where it can be stored in large containers and then piped into patients’ rooms. Many hospitals in poor countries, however, aren’t equipped to store liquid oxygen, and must rely on an external supply. If a hospital is in a remote location, this can be a serious logistical challenge. Another option is to install on-site plants that extract oxygen from the air. These systems, which use a technology known as pressure swing adsorption, or P.S.A., are expensive, and require maintenance. In October, the Indian government announced plans to build a hundred and sixty-two such plants around the country; thus far, thirty-three have been installed. Laxminarayan’s organization also hopes to create dozens of oxygen-generation plants at Indian hospitals. For now, many hospitals rely on simpler, decentralized technology, which comes with disadvantages: the gaseous oxygen contained in cylinders can cost ten times as much as its liquid equivalent, and oxygen concentrators are usually intended for only one or a few patients at a time. Whatever the process, it’s clear that too many Indians are going without the oxygen they need. Since this February, India’s oxygen requirements have increased fifteenfold; it now needs nearly three times as much medical-grade oxygen as it did during the height of its first wave. Some hospitals have run out of oxygen, and others are on the precipice. Hospitals won’t admit patients whom they can’t treat; many Indians therefore suffer a suffocating illness at home. The government is doing what it can: granting oxygen-transport vehicles an ambulance-like status on roads; leveraging the national railway service to move tankers around the country; enlisting the air force to transport empty containers back to factories to be refilled. On Wednesday, India’s Supreme Court ordered the federal government to present a more comprehensive plan to meet New Delhi’s oxygen needs. Meanwhile, foreign governments and international aid organizations are sending ventilators, concentrators, and cylinders. Still, each day brings fresh reports of people dying because they can’t get oxygen. (The shortage is likely to spread: globally, the deficit of medical oxygen—the gap between what’s needed and what’s being produced—has tripled in recent months, in part owing to the unmet need in India but also because of growing demand in South America and the Middle East.) Technically, Indians have access to universal health coverage: the country’s constitution guarantees everyone a “right to life,” and people can receive care at government facilities free of charge. But, over decades, low levels of public financing have led to poor quality and severe staff and supply shortages. India’s federal government spends around one per cent of G.D.P. on health care—far less than most large economies. Moreover, states share responsibility with the federal government for health-care delivery, and that has resulted in a large variation in funding and quality. Many Indians therefore opt to pay for private health care, if they can afford it, and the private sector now provides most care in India, even though commercial health insurance is available to only a fraction of the population and out-of-pocket costs can be devastating. In 2018, the central government launched a major effort aimed at insuring that low-income people could receive care at private facilities. But relatively few Indians have a regular place of care where they can receive ongoing management of their medical conditions or outpatient testing and treatment for covid-19. The coronavirus has severely strained India’s critical-care capacity, which was lacking even before the pandemic: during normal times, the country has around fifteen per cent of the critical-care specialists it needs. More generally, India has nine doctors for every ten thousand people—about half the global average, and only a third as many as the U.S. There’s also the issue of maldistribution: two-thirds of India’s population lives in rural areas, where only twenty per cent of the nation’s doctors work. (Shortages of nurses and other clinicians can be even worse.) VIDEO FROM THE NEW YORKER The Pandemic Through the Eyes of a Three-Year-Old Still, India’s physician-to-patient ratio is higher than that of Bangladesh, Nepal, or any nation in sub-Saharan Africa. Many of the globe’s myriad health-care systems share the fundamental constraints that have transformed India’s second wave into a humanitarian crisis—including an oxygen-delivery infrastructure that is unable to meet the demands of a vast viral surge. Many Indians have experienced the current surge as a surprise. But the forces driving it are fundamentally familiar. “Society opened up without restraint,” K. Srinath Reddy, the president of the Public Health Foundation of India and the former chair of cardiology at the All India Institute of Medical Sciences, told me. “It was widely perceived that the pandemic is behind us, that we are unlikely to have a second wave. We didn’t just return to 2019—we entered 2021 with an extra degree of exuberance.” Politicians encouraged people to gather at massive rallies; cricket stadiums filled with fans; malls opened to shoppers and weddings welcomed guests. The government sanctioned the Kumbh Mela, a Hindu religious festival, and millions of people made the pilgrimage to Haridwar, in the northern state of Uttarakhand, to wash in the River Ganges. The festival started on April 1st and continued for nearly three weeks before the coronavirus toll became unbearable and undeniable. Afterward, people carried the virus back to far-flung cities and villages. “The euphoria of putting the pandemic behind us was a widely prevalent emotion, and it suited everyone,” Reddy said. “Industry wanted to get back to full production. Small traders wanted to get back to business. Ordinary citizens wanted to get back to their lives.” Many countries have engaged in wishful thinking during the pandemic; all have struggled to fight the virus while avoiding economic collapse. The Indian experience speaks specifically to the problem of endurance, and raises the question of how long low- and middle-income countries can maintain pandemic protocols absent a clear time line for widespread vaccination. The U.S. and much of Europe have navigated the pandemic while looking forward to early and reliable access to vaccines; if we didn’t have a firm end date, we at least knew that an end was approaching. Under such conditions, politicians and the public can examine, debate, and accept the costs of restrictions. But that calculus is harder, perhaps impossible, without some assurance that pandemic life is temporary. ADVERTISEMENT **The global vaccination effort has faltered, with poor countries receiving a fraction of the vaccines they had expected. covax, the world’s primary initiative to promote vaccine equity, had planned to deliver two billion doses in 2021; so far, it’s sent out about fifty million. Less than half of one per cent of all covid-19 vaccines have been administered in poor nations.** “We’re now in this very strange situation where we’re talking about fourteen-year-olds in America getting vaccinated, while older people around the world remain vulnerable and entire countries are devastated,” Ashish Jha, the dean

of Brown’s public-health school, told me. **“It’s a moral issue, but it’s also an epidemiological one. We’re placing everyone at risk when we let the virus run rampant. It creates a huge substrate for new variants. We need to quadruple our efforts to get the world vaccinated.**” That has to be the No. 1 priority for the Biden Administration going forward.” The U.S. has committed four billion dollars to covax, which still faces a funding shortfall of tens of billions of dollars. Last week, the Biden Administration also announced its support for waiving intellectual-property protections for covid-19 vaccines. **The proposed waiver—it must be approved by the World Trade Organization—has been hailed by many public-health practitioners,** the director-general of the W.H.O., Tedros Adhanom Ghebreyesus, called Biden’s support for the proposal “a monumental moment” in the fight against the pandemic. But others have sounded a cautionary note, raising the possibility that the spectre of patent waivers will disincentivize companies from investing in vaccine and drug development in the future. “I wonder whether we want to send potential firms the message that the larger the health crisis, the less we will respect and protect your I.P.,” Craig Garthwaite, a professor at Northwestern University, tweeted, after the Biden Administration’s announcement. “That’s a great system if you think this is the last pandemic we’ll face.”

B: That causes Indo-Pak Conflict Escalation

Somos 20. [Christy Somos is a CTVNews.ca Writer) “COVID-19 has escalated armed conflict in India, Pakistan, Iraq, Libya and the Philippines, study finds,” CTV News, December 17, 2020.
<https://www.ctvnews.ca/world/covid-19-has-escalated-armed-conflict-in-india-pakistan-iraq-libya-and-the-philippines-study-finds-1.5236738>] TDI

INDIA India saw a rise in armed conflict during the study period, with violent clashes in the Kashmir region between Kashmiri separatists facing off against the Indian military, as well as **conflicts between Pakistan and India.** “So what mostly drove the increase in conflict intensity...were basically due to two factors,” Ide said. “The first being that **there is some evidence that Pakistan sponsors or supports these insurgents in Kashmir, to encourage them to increase their attacks [on Indian forces] because they perceived them to be weak and struggling with the pandemic.**” The second factor, Ide explained, was that **while Indian government enacted a “pretty comprehensive lockdown in Kashmir, and sealing it way from international media attention...launched more intense counter-insurgency efforts and...crack[ed] down on any pro-Pakistani sympathy expressions.”** IRAQ Iraq had an increase in armed conflict, but Ide noted that the overall intensity did not change that much—a “very slight upward trend” in scale that was not linear. What did increase were attacks by ISIS in April, May, and June. “The Iraqi government was really in trouble,” he said. “They had enormous economic loss, they had to go head-to-head and use troops and funds to combat the pandemic—the international coalition supporting the government partially withdrew troops or stopped their activities.” “The Iraqi government was really in a position of weakness.” Ide said the Islamic State exploited the pandemic and the thin resources at hand to the government to expand territorial control, conquer new areas and to stage more attacks. LIBYA The civil war in Libya between the Government of National Accord’s (GNA) forces and the Libyan National Army escalated during the study period, after a ceasefire brokered in January was broken, Ide said. “As soon as international attention shifted to the pandemic...they really escalated the conflict, tried to make gains while hoping the other side is weakened because of the pandemic, hoping to score an easy military victory” Ide said. “It didn’t happen.” The UN Security Council noted in a May report that the pandemic was bolstering the

15-month conflict, citing the history of more than 850 broken ceasefire agreements and “a tide of civilian deaths” on top of a worsening outbreak. PAKISTAN The ongoing conflict with India saw a rise in armed conflict in Pakistan during the study period – which were unrelated to the pandemic, but also a rise in Taliban-affiliated groups and anti-government sentiments due to pandemic restrictions, Ide said. “There were a lot of anti-government grievances,” Ide said. “There were restrictions on religious gatherings, which religious groups did not like, and there were some negative economic impacts which affected the local people.” Ide said those two factors could have been exploited by the Taliban in a quest to recruit more followers. Later in the study period, a swath Pakistani government officials were struck with COVID-19, leaving the country with a leadership crisis, which saw an increase of attacks by Taliban groups in May.

C: Extinction

Roblin 21. [(Sébastien Roblin holds a master’s degree in Conflict Resolution from Georgetown University and served as a university instructor for the Peace Corps in China, "If the Next India-Pakistan War Goes Nuclear, It Will Destroy the World," The National Interest, March 26, 2021. <https://nationalinterest.org/blog/reboot/if-next-india-pakistan-war-goes-nuclear-it-will-destroy-world-181134>] TDI

Here's What You Need to Remember: India and Pakistan account for over one-fifth world’s population, and therefore a significant share of economic activity. Should their major cities become irradiated, ruins with their populations decimated, a tremendous disruption would surely result.

Between February 26 and 27 in 1971, Indian and Pakistani warplanes launched strikes on each other’s territory and engaged in aerial combat for the first time since 1971. Pakistan ominously hinted it was convening its National Command Authority, the institution which can authorize a nuclear strike.

The two states, which have retained an adversarial relationship since their founding in 1947, between them deploy nuclear warheads that can be delivered by land, air and sea. However, those weapons are inferior in number and yield to the thousands of nuclear weapons possessed by Russia and the United States, which include megaton-class weapons that can wipe out a metropolis in a single blast. Some commenters have callously suggested that means a “limited regional nuclear war” would remain an Indian and Pakistani problem. People find it difficult to assess the risk of rare but catastrophic events; after all, a full-scale nuclear war has never occurred before, though it has come close to happening. Such assessments are not only shockingly callous but shortsighted. In fact, several studies have modeled the global impact of a “limited” ten-day nuclear war in which India and Pakistan each exchange fifty 15-kiloton nuclear bombs equivalent in yield to the Little Boy uranium bomb dropped on Hiroshima. Their findings concluded that spillover would in no way be “limited,” directly impacting people across the globe that would struggle to locate Kashmir on a map.

And those results are merely a conservative baseline, as India and Pakistan are estimated to possess over 260 warheads. Some likely have yields exceeding 15-kilotons, which is relatively small compared to modern strategic warheads. Casualties Recurring terrorist attacks by Pakistan-sponsored militant groups over the status of India’s Muslim-majority Jammu and Kashmir state have repeatedly led to threats of a conventional military retaliation by New Delhi. Pakistan, in turn, maintains it may use nuclear weapons as a first-strike weapon to counter-balance India’s superior conventional forces. Triggers could involve the destruction of a large part of Pakistan’s military or penetration by Indian forces deep into Pakistani territory. Islamabad also claims it might authorize a strike in event of a damaging Indian blockade or political destabilization instigated by India. India’s official policy is that it will never be first to strike with nuclear weapons—but that once any nukes are used against it, New Dehli will unleash an all-out retaliation. The Little Boy bomb alone killed around 100,000 Japanese—between 30 to 40 percent of Hiroshima’s population—and destroyed 69 percent of the buildings in the city. But Pakistan and India host some of the most populous and densely populated cities on the planet, with population densities of Calcutta, Karachi and Mumbai at or exceeding 65,000 people per square mile. Thus, even low-yield bombs could cause tremendous casualties. A 2014 study estimates that the immediate effects of the bombs—the fireball, over-pressure wave, radiation burns etc.—would kill twenty million people. An earlier study estimated a hundred 15-kiloton nuclear detonations could kill twenty-six million in India and eighteen million in Pakistan—and concluded that escalating to using 100-kiloton warheads, which have greater blast radius and overpressure waves that can shatter hardened structures, would multiply death tolls four-fold. Moreover, these projected body counts omit the secondary effects of nuclear blasts. Many survivors of the initial explosion would suffer slow, lingering deaths due to radiation exposure. The collapse of healthcare, transport, sanitation, water and economic infrastructure would also claim many more lives. A nuclear blast could also trigger a deadly firestorm. For instance, a firestorm caused by the U.S. napalm bombing of Tokyo in March 1945 killed more people than the Fat Man bomb killed in Nagasaki. Refugee Outflows The civil war in Syria caused over 5.6 million refugees to flee abroad out of a population of 22 million prior to the conflict. Despite relative stability and prosperity of the European nations to which refugees fled, this outflow triggered political backlashes that have rocked virtually every major Western government. Now consider likely population movements in event of a nuclear war between India-Pakistan, which together total over 1.5 billion people. Nuclear bombings—or their even their mere potential—would likely cause many city-dwellers to flee to the countryside to lower their odds of being caught in a nuclear strike. Wealthier citizens, numbering in tens of millions, would use their resources to flee abroad. Should bombs begin dropping, poorer citizens many begin pouring over land borders such as those with Afghanistan and Iran for Pakistan, and Nepal and Bangladesh for India. These poor states would struggle to supports tens of millions of refugees. China also borders India and Pakistan—but historically Beijing has not welcomed

refugees. Some citizens may undertake risky voyages at sea on overloaded boats, setting their sights on South East Asia and the Arabian Peninsula. Thousands would surely drown. Many regional governments would turn them back, as they have refugees of conflicts in Vietnam, Cambodia and Myanmar in the past. **Fallout** **Radioactive fallout would also be disseminated across the globe.** The **fallout from the Chernobyl** explosion, for example, **wound**s its **way westward from Ukraine into Western Europe**, exposing 650,000 persons and contaminating 77,000 square miles. The **long-term health effects** of the exposure **could last decades**. India and Pakistan's **neighbors would be especially exposed**, and **most lack healthcare and infrastructure to deal with such a crisis.** **Nuclear Winter**. Studies in 2008 and 2014 found that of one hundred bombs that were fifteen-kilotons were used, **it would blast five million tons of fine sooty particles into the stratosphere where they would spread across the globe, warping global weather patterns** for the next twenty-five years.

The particles would **block out** light from the **sun**. **Causing surface temperatures to decrease** an average of 2.7 degrees Fahrenheit across the globe, or 4.5 degrees in North American and Europe. **Growing seasons would be shortened** by ten to forty days, and certain **crops** such as Canadian wheat **would** simply **become unviable**. Global agricultural **yields would fall** leading to rising prices and **famine**. The particles may also **deplete** between 30 to 50 percent of **the ozone layer**, **allowing** more of **the sun's radiation** to penetrate the atmosphere, **causing increased sunburns and rates of cancer and killing off sensitive plant-life and marine plankton**, with the spillover effect of **decimating fishing yields**. To be clear, **these are outcomes for a "light" nuclear winter scenario**, not a full slugging match between the Russian and U.S. arsenals. **Global Recession**. **Any** one of the **factors above would** likely suffice to **cause a global economic recession**. All of them combined would guarantee one. **India and Pakistan account for over one-fifth world's population**, and therefore a significant **share of economic activity**. **Should their major cities become irradiated ruins with their populations decimated, a tremendous disruption would surely result. A massive decrease in consumption and production would** obviously **instigate a long-lasting recessionary cycle, with attendant deprivations and political destabilization** slamming developed and less-developed countries alike. Taken together, these outcomes **mean even a "limited" India-Pakistan nuclear war would** significantly **affect** every person on the **globe** be they a school teacher in Nebraska, a factory-worker in Shaanxi province or a fisherman in Mombasa. Unfortunately, the **recent escalation** between India and Pakistan **is no fluke, but part of a long-simmering pattern likely to continue escalating** unless New Delhi and Islamabad work together to change the nature of their relationship.

D: The Plan Solves and WTO IP rules are a barrier to scaled-up vaccine production

Pandey 21. [(Ashutosh Pandey) "Rich countries block India, South Africa's bid to ban COVID vaccine patents," DW, April 2, 2021.

<https://www.dw.com/en/rich-countries-block-india-south-africas-bid-to-ban-covid-vaccine-patents/a-56460175>

The World Trade Organization (WTO) talks on a proposal by India and South Africa to temporarily suspend intellectual property (IP) **rules related to COVID-19 vaccines and treatments hit a roadblock** on Thursday after wealthy countries balked at the idea, Germany's dpa news agency reported. The two developing countries say the IP waiver will allow drugmakers in poor countries to start production of effective vaccines sooner. **India and South Africa had approached the global trade body** in October, **calling on it to waive parts of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement).** The **suspension of rights** such as patents, industrial designs, copyright and protection of undisclosed information **would ensure "timely access to affordable medical products including vaccines and medicines or to scaling-up of research, development, manufacturing and supply of medical products essential to combat COVID-19,"** they said. **The proposal was vehemently opposed by wealthy nations** like the US and Britain as well as the European Union, who said that a ban would stifle innovation at pharmaceutical companies by robbing them of the incentive to make huge investments in research and development. This would be especially counterproductive during the current pandemic which needs the drugmakers to remain on their toes to deal with a mutating virus, they argue. **The WTO talks are taking place as some wealthy countries face criticism for cornering billions of COVID shots — many times the size of their populations — while leaving poor countries struggling for supplies. Experts say the global scramble for vaccines, or vaccine nationalism, risks prolonging the pandemic.** "We have to recognize that **this virus knows no boundaries**, it travels around the globe and the response to it should also be global. **It should be based on international solidarity**," said Ellen 't Hoen, the director of Medicines Law & Policy — a nonprofit campaigning for greater access to medicines. "Many of **the large-scale vaccine manufacturers are based in developing countries. All the production capacity that exists should be exploited...** and that does require the sharing of **Not enough production capacity Supporters** of the waiver, which include dozens of developing and least-developed countries and NGOs, **said the WTO's IP rules were acting as a barrier to urgent scale-up of production of vaccines** and other much needed medical equipment in poor countries.

2: Reduction of Innovation

A: Patents stifle innovation

Mercurio, Bryan. TRIPs, Patents and Innovation: A Necessary Reappraisal? E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2014. www.e15initiative.org

Identifying the factors that stimulate innovation is difficult (Lemley 2000), and attention must be paid to the different kinds of innovation--cumulative innovation; horizontal (basic) innovation; and vertical (applied) innovation. The impact of patent protection can differ on each of these types of innovation. For instance, where cumulative innovation occurs--that is, where a single product may rely on inventions owned by a number of firms--"there is good reason to think that the patent system may discourage innovation overall rather than encouraging it" (Bessen and Maskin 2009; Chu et al. 2012). Shapiro (2001) finds that "with cumulative innovation and multiple blocking patents, stronger patent rights can have the perverse effect of stifling, not encouraging innovation." In such a situation, multiple licences have to be purchased; uncertainty regarding the status of the technology persists; and the value of patent licensing is questioned (Heller 2008; Boldrin and Levine 2008). Lawsuits become the norm; costs rise as firms defend claims and play the game by defensively purchasing patents; and innovation suffers (Boldrin and Levine 2013; Bessen and Muerer 2008). One only needs to look at the present situation in the high-tech sector to see this cycle playing out, where as much as US\$20 billion was spent in 2010-11 on patent litigation and purchases, and where a "patent tax" of up to 20 percent of R&D costs exists (Duhigg and Lohr 2012).

B: Patent thickets exacerbate the neg effect on innovation

Mercurio, Bryan. TRIPs, Patents and Innovation: A Necessary Reappraisal? E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2014. www.e15initiative.org

The negative effect on innovation is exacerbated by a number of factors, including the growing problem of patent thickets. Owing to the "difficulty of determining the boundaries" of patent claims, there are often multiple and competing claims over one or more aspects of an invention--situations which, Stiglitz states, "especially impede innovation" (2008). While patent thickets have existed for more than a hundred years (a patent thicket impeded the development and commercialization of the airplane), they have more recently become particularly widespread in the electronics industry (GAO 2013). Other factors, such as defensive patenting and the extortion-like practices of so-called patent trolls, have likewise substantially increased the risk of net welfare loss and less innovation (Bessen et al. 2011; Tucker 2011). Recent studies even find that patent pool arrangements result in reduced innovation by member-firms (Lampe and Moser 2010; Joshi and Nerkar 2011; Lampe and Moser 2012)

3: Reduction of IP Protections is necessary to uphold the BWC

A: convergence of ai and biotech creates a nexus of living threats deployable through nanobots.

Lentzos 20 - (Filippa Lentzos Filippa Lentzos is a Senior Lecturer in Science & International Security at the Department of War Studies and Co-Director of the Centre for Science and Security Studies (CSSS) at King's College London. She is also an Associate Senior Researcher at the Stockholm International Peace Research Institute (SIPRI) and a Non-Resident Scholar at the James Martin Center for Nonproliferation Studies (CNS). Her research focuses on biological threats and on the security and governance of emerging technologies in the life sciences. A biologist and social scientist by training, Dr Lentzos has researched and been actively involved in biological disarmament and non-proliferation for nearly 20 years) - "How to protect the world from ultra-targeted biological weapons" - Bulletin Of The Atomic Scientists - [how-to-protect-the-world-from-ultra-targeted-biological-weapons](#) - December 7, 2020

Various risk assessment frameworks have been used to get a sense of the potential security risks arising from the mix of artificial intelligence and biotechnology. But balancing the generality needed to capture a broad scope of converging technologies in the life sciences with the need to maintain enough specificity to capture nuances has proved difficult. The main security concerns boil down to worries that, if the intent were there, **the convergence of emerging technologies could be used to speed up the identification of harmful genes or DNA sequences.** More specifically, there are concerns that **adding advanced pattern recognition to genomic data could significantly facilitate: the enhancement of pathogens to make them more dangerous; the modification of low-risk pathogens to become high-impact; the engineering of entirely new pathogens; or even the re-creation of extinct, high-impact pathogens like the variola virus that causes smallpox.** **These possibilities are coming** at a time **when new delivery mechanisms for transporting pathogens into human bodies are also being developed.** **In addition to the bombs, missiles, cluster bombs, sprayers, and injection devices of past biowarfare programs, it could now also be possible to use drones, nano-robots, even insects.**

B: Convergence of biotech and AI magnifies the risk of malicious actors like Russia getting access

Lentzos 20 - (Filippa Lentzos Filippa Lentzos is a Senior Lecturer in Science & International Security at the Department of War Studies and Co-Director of the Centre for Science and Security Studies (CSSS) at King's College London. She is also an Associate Senior Researcher at the Stockholm International Peace Research Institute (SIPRI) and a Non-Resident Scholar at the James Martin Center for Nonproliferation Studies (CNS). Her research focuses on biological threats and on the security and governance of emerging technologies in the life sciences. A biologist and social scientist by training, Dr Lentzos has researched and been actively involved in biological disarmament and non-proliferation for nearly 20 years) - "How to protect the world from ultra-targeted biological weapons" - Bulletin Of The Atomic Scientists - [how-to-protect-the-world-from-ultra-targeted-biological-weapons](#) - December 7, 2020

Added to these pathogen-specific risks are traditional cyber risks and "cyber-biosecurity" risks focused particularly on the bioeconomy. Cyber-biosecurity risks include waging adversarial attacks on automated bio-computing systems, biotech supply chains, or strategic cyber-biosecurity infrastructure. **Malicious actors could, for example, use AI malware to co-opt networks of sensors and impact control decisions on biotech supply chains with the intent to damage, destroy, or contaminate vital stocks of vaccines.**

antibiotics, cell, or immune therapies. In another scenario, AI malware could be used to automate data manipulation with the intent to falsify, erase, or steal intelligence within large curations of genomics data. Such data poisoning could affect how pathogens are detected and analysed. It could also affect biointelligence on complex diseases in subpopulations collected over many years.

C: Only transparency can end the possibility of secret or suspected development of genetic weapons, and the resulting threat construction

Lentzos 20 - (Filippa Lentzos Filippa Lentzos is a Senior Lecturer in Science & International Security at the Department of War Studies and Co-Director of the Centre for Science and Security Studies (CSSS) at King's College London. She is also an Associate Senior Researcher at the Stockholm International Peace Research Institute (SIPRI) and a Non-Resident Scholar at the James Martin Center for Nonproliferation Studies (CNS). Her research focuses on biological threats and on the security and governance of emerging technologies in the life sciences. A biologist and social scientist by training, Dr Lentzos has researched and been actively involved in biological disarmament and non-proliferation for nearly 20 years) - "How to protect the world from ultra-targeted biological weapons" - Bulletin Of The Atomic Scientists - [how-to-protect-the-world-from-ultra-targeted-biological-weapons](#) - December 7, 2020

The merger of the biological data revolution with computing power has created another serious security concern: ultra-targeted biological warfare. In past biowarfare programs, weapons targeted their intended victims through geographic location. Advances in biotechnology open up the possibility that malicious actors could deploy a biological weapon over a broad geographic area but only affect targeted groups of people, or even individuals. The possibility of such "genetic weapons" was first discussed in the biological arms control community in the 1990s, as the Human Genome Project to map the full complement of human genes got underway. The UK government said "it cannot be ruled out that information from such genetic research could be considered for the design of weapons targeted against specific ethnic or racial groups." The British Medical Association cautioned that "the differential susceptibility of different populations to various diseases" had been considered in the past, and that "whilst we should hope that genetic weapons are never developed, it would be a great mistake to assume that they never can be, and therefore that we can safely afford to ignore them as a future possibility." A report from the Stockholm International Peace Research Institute (SIPRI) spoke of the potential for "future development of weapons of mass extermination which could be used for genocide." Developments in genomic technologies and other emerging technologies, especially machine and deep learning, have spurred renewed concerns. "Access to millions of human genomes—often with directly associated clinical data—means that bioinformaticians can begin to map infection susceptibilities in specific populations." a recent report from the United Nations Institute for Disarmament Research warned. A United Nations University report, meanwhile, asserts that "deep learning may lead to the identification of 'precision maladies,' which are the genetic functions that code for vulnerabilities and interconnections between the immune system and microbiome. Using this form of bio-intelligence, malicious actors could engineer pathogens that are tailored to target mechanisms critical in the immune system or the microbiome of specific subpopulations." A 2018 National Academies of Sciences report suggests "[a]ctors may consider designing a bioweapon to target particular subpopulations based on their genes or prior exposure to vaccines, or even seek to suppress the immune system of victims to 'prime' a

population for a subsequent attack. **These capabilities**, which were feared decades ago but never reached any plausible capability, **may be made increasingly feasible by the widespread availability of health and genomic data.**

D: Reduction of IP Protections allows for more transparency, especially in private sectors, allowing the enforcement of the BWC

Lentzos 20 - (Filippa Lentzos Filippa Lentzos is a Senior Lecturer in Science & International Security at the Department of War Studies and Co-Director of the Centre for Science and Security Studies (CSSS) at King's College London. She is also an Associate Senior Researcher at the Stockholm International Peace Research Institute (SIPRI) and a Non-Resident Scholar at the James Martin Center for Nonproliferation Studies (CNS). Her research focuses on biological threats and on the security and governance of emerging technologies in the life sciences. A biologist and social scientist by training, Dr Lentzos has researched and been actively involved in biological disarmament and non-proliferation for nearly 20 years) - "How to protect the world from ultra-targeted biological weapons" - Bulletin Of The Atomic Scientists - [how-to-protect-the-world-from-ultra-targeted-biological-weapons](#) - December 7, 2020

Experts at SIPRI have suggested that, because of the complexity required to create them, ultra-targeted biological weapons are relatively unlikely to be used: "If the purpose is to harm a specific individual or group, most malevolent actors would surely resort to more low-tech or direct methods, such as firearms or poison." This suggestion may be accurate, but it is not, unfortunately, a sufficient basis for biological arms control in the 21st century. As one of the great champions of biological disarmament, **Matthew Meselson, professor of molecular biology at Harvard University, reflected** in 2000 as he contemplated the century ahead in an essay on averting the hostile exploitation of biotechnology: "[A]s our ability to modify fundamental life processes continues its rapid advance, we will be able not only to devise additional ways to destroy life but will also become able to manipulate it—including the processes of cognition, development, reproduction and inheritance... Therein could lie unprecedented opportunities for violence, coercion, repression, or subjugation." The current disarmament regime, **the Biological Weapons Convention**, has been in force since 1975. The **treaty** comprehensively prohibits biological weapons, understood as biological agents used for harmful purposes, and countries that are party to the treaty agree that it unequivocally covers all microbial or other biological agents or toxins, naturally or artificially created or altered, as well as their components, whatever their origin or method of production. On the whole, this **covers the pathogen-specific risks and risks of ultra-targeted biological weapons.** Indeed, the UK government, which first raised the issue of genetic weapons as a possibility in the mid 1990s, specifically stated that genetic weapons would be a "clear contravention" of the treaty. Cyber-biosecurity risks are not covered by the BWC, but the BWC and arms control treaties more generally are not appropriate instruments to address these sorts of risks. Where there might be some uncertainty around the coverage of the BWC is where the harms do not involve biological agents. Developments in science and technology are making novel biological weapons that, instead of using bacteria or viruses to make us sick, directly target the immune, nervous or endocrine systems, the microbiome, or even the genome by interfering with, or manipulating, biological processes. This could be achieved, for example, by using a construct based on synthetic structures created or inspired by DNA or RNA, but not qualifying as DNA, RNA, or any other known, naturally occurring nucleic acid. In this sort of case, the coverage of the BWC is less clear, but the intent of the treaty to prohibit such harm is beyond doubt. **The real challenge for the treaty**, however, **is** not in its coverage but **in ensuring that countries comply with it and live up to their obligations.** **This** oversight **is** particularly difficult **because**

the relevant materials, equipment, and technical know-how are diffused across multiple and varied scientific disciplines and sectors—and they are increasingly in private, rather than public, **hands**. Moreover, biological agents themselves exist in nature and are living organisms generally capable of natural reproduction and replication. The dual-use nature of biology and the challenges it poses for compliance assessment was recognized in the early phase of the negotiations on the treaty. In a 1968 statement to the predecessor of the Conference on Disarmament, the United Kingdom noted, for instance, that no verification is possible in the sense of the term as we normally use it in disarmament discussions. In other words, it was not considered possible to verify the BWC with the same level of accuracy and reliability as the verification of nuclear treaties like the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which was negotiated immediately prior to the BWC. Consequently, Article I of the BWC—through which states “agree to never under any circumstances acquire or retain biological weapons”—is therefore vague in demarcating the borders of prohibited and legitimate activities. Article I merely refers to biological agents “of types and in quantities that have no justification for prophylactic, protective, or other peaceful purposes.” The main responsibility for compliance assessment in the BWC falls on the countries that are party to it, unlike in its sister-conventions, the Chemical Weapons Convention and the NPT, where compliance assessment is tasked to the Organisation for the Prohibition of Chemical Weapons (OPCW) and the International Atomic Energy Agency (IAEA). **In the BWC, each country relies on its own resources to assess other countries’ compliance.** The United Nations Security Council acts as the final arbitrator on allegations of compliance breaches—though it has not to date been requested to investigate any allegations. The role of the treaty’s Implementation Support Unit is purely to support countries in their efforts to implement the BWC. **The “general purpose criterion” of the BWC** means the treaty **permits almost any kind of biological research for defensive or protective purposes.** Some such work is justifiable. Other **research edges closer to the blurred line between defensive and offensive work.** Distinguishing permitted biodefense projects from those that are prohibited is difficult; one cannot just assess the facilities, equipment, material, and activities involved, but must also examine and interpret the purpose, or intent, of those activities. A series of significant and accelerating advances in abilities to manipulate genes and biological systems have made Cold War-era tools of compliance assessment increasingly outdated. Among those new abilities are:

- The addition of machine and deep learning to bioinformatics.
- The coupling of those developments with “cloud labs,” third-party firms that are centralizing and scaling the wet work of genetic engineering.
- Research on deliberately releasing viruses into the environment.
- The rise in biodefense programs and the build-up in those programs’ capacities.

To establish the intent of biological research, it is not enough to simply count fermenters, measure the sizes of autoclaves, and limit amounts of growth media. A growing number of countries recognize that biology, to a large extent, defies material accountancy-type verification methodologies. The United Kingdom, for instance, recently noted that BWC **compliance is “much more one of transparency, insight, and candour, rather than material balances or counting discrete objects such as fermenters.”** Somewhat ironically in our ever-increasing digital world, the last few years has seen a move away from strictly quantitative approaches and binary models of compliance assessment in biological arms control toward more qualitative methods.

E: Impact of Extinction, Bioweapons outweigh mathematically

Millett & Snyder-Beattie ‘17. Millett, Ph.D., Senior Research Fellow, Future of Humanity Institute, University of Oxford; and Snyder-Beattie, M.S., Director of Research, Future of Humanity Institute, University of Oxford. 08-01-2017. “Existential Risk and Cost-Effective Biosecurity,” Health Security, 15(4), PubMed

In the decades to come, **advanced bioweapons could threaten human existence**. Although the **probability** of human extinction from bioweapons **may be low**, the **expected value** of **reducing** the **risk** could **still be large**, since such **risks jeopardize** the existence of **all future generations**. We provide an overview of biotechnological extinction risk, make some rough initial estimates for how severe the risks might be, and compare the cost-effectiveness of reducing these extinction-level risks with existing biosecurity work. We find that reducing human extinction risk can be more cost-effective than reducing smaller-scale risks, even when using conservative estimates. This suggests that the risks are not low enough to ignore and that more ought to be done to prevent the worst-case scenarios. How worthwhile is it spending resources to study and mitigate the chance of human extinction from biological risks? The risks of such a catastrophe are presumably low, so a skeptic might argue that addressing such risks would be a waste of scarce resources. In this article, we investigate this position using a cost-effectiveness approach and ultimately conclude that the expected value of reducing these risks is large, especially since such risks jeopardize the existence of all future human lives. **Historically, disease events have been responsible for the greatest death tolls on humanity**. The 1918 flu was responsible for more than 50 million deaths,¹ while smallpox killed perhaps 10 times that many in the 20th century alone.² The Black Death was responsible for killing over 25% of the European population,³ while other pandemics, such as the plague of Justinian, are thought to have killed 25 million in the 6th century—constituting over 10% of the world's population at the time.⁴ It is an open question whether **a future pandemic could result in outright human extinction or the irreversible collapse of civilization**. A **skeptic** would have many good reasons **to think** that existential risk from disease is **unlikely**. Such a disease would need **to spread** worldwide **to remote populations**, **overcome rare genetic resistances**, and **evade detection, cures, and countermeasures**. Even evolution itself may work in humanity's favor: **Virulence and transmission is often a trade-off**, and so **evolutionary pressures** could push against maximally lethal wild-type pathogens.^{5,6} While **these arguments** point to a very small risk of human extinction, they **do not rule** the possibility **out** entirely. Although rare, there are recorded instances of **species going extinct due to disease**—primarily in amphibians, but also in 1 mammalian species of rat on Christmas Island.^{7,8} **There are also historical examples of large human populations being almost entirely wiped out** by disease, especially when multiple diseases were simultaneously introduced into a population without immunity. The most striking examples of total population collapse include **native American tribes** exposed to European diseases, such as the **Massachusetts** (86% loss of population), **Quiripi-Unquachog** (95% loss of population), and the **Western Abenaki** (which suffered a staggering 98% loss of population).⁹ **In the modern context, no single disease currently exists that combines the worst-case levels of transmissibility, lethality, resistance to countermeasures, and global reach**. But **many diseases are proof** of principle that **each worst-case attribute can be realized independently**. For example, **some diseases exhibit nearly a 100% case fatality ratio in the absence of treatment**, such as rabies or septicemic plague. Other diseases have a track record of spreading to virtually every human community worldwide, such as the 1918 flu,¹⁰ and seroprevalence studies indicate that other pathogens, such as chickenpox and HSV-1, can successfully reach over 95% of a population.^{11,12} Under optimal virulence theory, **natural evolution** would be an **unlikely** source for pathogens with the **highest possible levels of transmissibility, virulence, and global reach**. But **advances in biotechnology might** allow the creation of diseases that **combine such traits**. Recent controversy has **already emerged** over a number of **scientific experiments** that **resulted in** viruses with **enhanced transmissibility, lethality, and/or the ability to overcome therapeutics**.¹³⁻¹⁷ Other experiments demonstrated that mousepox could be modified to have a

100% case fatality rate and render a vaccine ineffective.¹⁸ In addition to transmissibility and lethality, studies have shown that other disease traits, such as incubation time, environmental survival, and available vectors, could be modified as well.¹⁹⁻²¹ Although these experiments had scientific merit and were not conducted with malicious intent, their implications are still worrying. This is especially true given that there is also a long historical track record of state-run bioweapon research applying cutting-edge science and technology to design agents not previously seen in nature. The Soviet bioweapons program developed agents with traits such as enhanced virulence, resistance to therapies, greater environmental resilience, increased difficulty to diagnose or treat, and which caused unexpected disease presentations and outcomes.²² Delivery capabilities have also been subject to the cutting edge of technical development, with Canadian, US, and UK bioweapon efforts playing a critical role in developing the discipline of aerobiology.^{23,24} While there is no evidence of state-run bioweapons programs directly attempting to develop or deploy bioweapons that would pose an existential risk, the logic of deterrence and mutually assured destruction could create such incentives in more unstable political environments or following a breakdown of the Biological Weapons Convention.²⁵ The possibility of a war between great powers could also increase the pressure to use such weapons—during the World Wars, bioweapons were used across multiple continents, with Germany targeting animals in WWI,²⁶ and Japan using plague to cause an epidemic in China during WWII.²⁷ Non-state actors may also pose a risk, especially those with explicitly omnicidal aims. While rare, there are examples. The Aum Shinrikyo cult in Japan sought biological weapons for the express purpose of causing extinction.²⁸ Environmental groups, such as the Gaia Liberation Front, have argued that “we can ensure Gaia's survival only through the extinction of the Humans as a species ... we now have the specific technology for doing the job ... several different [genetically engineered] viruses could be released”(quoted in ref. 29). Groups such as R.I.S.E. also sought to protect nature by destroying most of humanity with bioweapons.³⁰ Fortunately, to date, non-state actors have lacked the capabilities needed to pose a catastrophic bioweapons threat, but this could change in future decades as biotechnology becomes more accessible and the pool of experienced users grows.^{31,32} What is the appropriate response to these speculative extinction threats? A balanced biosecurity portfolio might include investments that reduce a mix of proven and speculative risks, but striking this balance is still difficult given the massive uncertainties around the low-probability, high-consequence risks. In this article, we examine the traditional spectrum of biosecurity risks (ie, biocrimes, bioterrorism, and biowarfare) to categorize biothreats by likelihood and impact, expanding the historical analysis to consider even lower-probability, higher-consequence events (catastrophic risks and existential risks). In order to produce reasoned estimates of the likelihood of different categories of biothreats, we bring together relevant data and theory and produce some first-guess estimates of the likelihood of different categories of biothreat, and we use these initial estimates to compare the cost-effectiveness of reducing existential risks with more traditional biosecurity measures. We emphasize that these models are highly uncertain, and their utility lies more in enabling order-of-magnitude comparisons rather than as a precise measure of the true risk. However, even with the most conservative models, we find that reduction of low-probability, high-consequence risks can be more cost-effective, as measured by quality-adjusted life year per dollar, especially when we account for the lives of future generations. This suggests that despite the low probability of such events, society still ought to invest more in preventing the most extreme possible biosecurity catastrophes

Impact Sheet:

The affirmative has a Indo-Pak Conflict leads to extinction

The affirmative has reduction of innovation

The affirmative also has a BWC Argument that leads to:

- Biological nanotech weapons
- Ultra-Targeted Bioweapons to commit mass genocide
- Extinction