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#### Dip cap key to check climate

Yu 20 Alan Yu, a senior fellow and the director of International Climate Policy at the Center for American Progress. Previously, he was a career foreign service officer at the State Department., 12-8-2020, "How U.S. Diplomacy and Diplomats Can Help Get International Climate Action Back on Track," Center for American Progress, https://www.americanprogress.org/issues/green/reports/2020/12/08/493528/u-s-diplomacy-diplomats-can-help-get-international-climate-action-back-track/, accessed 7/27/2021 EH

Throughout the 2020 presidential campaign and in the early days of the transition, President-elect Joe Biden has made clear that climate action will be a core element of his plan to “build back better,” driving toward a more resilient, sustainable economy that will put the United States on an irreversible path to achieve net-zero emissions by no later than 2050.1 President-elect Biden’s first foreign policy actions have also demonstrated a commitment to make climate change a central pillar of his foreign policy. He has announced a senior national security team that recognizes the linkage between U.S. national security and climate change and is committed to climate action.2 He has raised climate action in every congratulatory call he has received from foreign leaders.3 And, most notably, he has created the new position of special presidential envoy (SPE) for climate change and enlisted former U.S. Secretary of State John Kerry, Washington’s leading climate champion—a strong signal that President-elect Biden intends to return the United States to global climate change leadership. President-elect Biden’s intention to position climate action as a central focus of U.S. foreign policy aligns with recommendations by the Center for American Progress and other leading international climate and U.S. foreign policy experts.4 Although President-elect Biden and SPE-designate Kerry will lead this transformation, it will be the U.S. Department of State and U.S. diplomats who will execute this new charge. This will require fundamental changes to the U.S. foreign policy apparatus and the work of its diplomats. At a time when experts are calling for reform and repurposing how the State Department executes a foreign policy to fit changing global challenges, now is the time to design for the centrality of climate action in the department’s mission and operations.5 There is no alternative to the United States for driving all countries toward climate ambition and action—including China, the world’s largest carbon emitter.6 Restoring U.S. leadership in the global fight against climate change is in the U.S. national interest and the global interest. But while the world would welcome the United States back to the fight against climate change, four years of head-snapping changes in U.S. policy—such as reversals in domestic climate policies and actions, withdrawal from the Paris Agreement, and retreat from global cooperation—have eroded trust in the United States’ consistency and commitment. America must demonstrate that it is a reliable global leader and partner. In order for the Biden administration to restore U.S. climate leadership and then drive global action, it will need to determine what the U.S. government will do and how it will do it. The president and his special envoy must lead, but they should put U.S. diplomats and the State Department in the central role to drive global climate action. This issue brief offers some priority actions for the new administration to consider and a series of detailed recommendations on how to execute these changes through leadership and actions by the president, the secretary of state, and U.S. ambassadors overseas. It concludes with recommendations on management reforms, including a boost in foreign service personnel, which the State Department should adopt to make the centrality of climate diplomacy in U.S. foreign relations built to last. A progressive U.S. agenda on global climate action President-elect Biden has been clear that a return to the Paris Agreement would be the first necessary step for the United States to reclaim its place in international climate leadership,7 but his administration will have much to do to repair the United States’ reputation and move to counter climate change. A U.S. agenda for international climate policy that prioritizes urgent and consequential outcomes should include the following core actions: Promptly deliver an ambitious and credible plan to demonstrate to the world that the United States will act domestically to reduce greenhouse gas emissions to net-zero by 2050.8 Reengage diplomatically in key multilateral processes and with major climate players such as China, India, the European Union, and Brazil to drive stronger and faster collective and country actions. Restore and elevate the United States’ work with developing countries to support their efforts to achieve their development goals in a clean energy pathway that aligns with the Intergovernmental Panel on Climate Change’s recommendation to limit global temperature rise to 1.5 degrees Celsius and that strengthens their resilience to the impacts of climate change.9 Accelerate work across U.S. agencies—such as the departments of State, Defense, Treasury, Agriculture, and Energy and the U.S. Agency for International Development (USAID)—and with key foreign governments, research institutions, and other stakeholders to deepen America’s understanding and planning to address the national security risk implications of climate change and develop measures to address them. Draw from the U.S. trade and financial policy toolkits to catalyze increased climate action by major emitters beyond U.S. borders. How can the Biden administration best position itself to drive climate action internationally? CAP identifies two key factors: Washington’s demonstration of climate leadership and a strategic use of the full power of U.S. diplomacy. Presidential leadership: The centrality of international climate action in words and deeds As noted earlier, President-elect Biden has demonstrated both in his statements and senior appointments his intention to prioritize climate action in his foreign policy agenda. As a practical matter, the new administration’s first priority on climate will be to deliver an ambitious and credible domestic plan to make up for lost progress. Demonstrating bold action at home is also the first step to regaining U.S. climate influence abroad to drive global action. In turn, helping to drive action internationally will be critical in order for the administration to sustain public support for domestic climate ambition. After he is sworn in, President-elect Biden should use the occasion of his first foreign policy speech to speak directly to the American people about the urgency of the climate crisis and the need for action—and explain how he will deliver climate results globally at the same time he calls for consequential domestic transformations. He should make the case that combatting climate change globally is in the economic and security interests of the United States and declare that, under his National Security Strategy, he will make achieving meaningful climate action beyond U.S. borders a central priority of U.S. foreign policy. President-elect Biden and senior leaders in his administration must reinforce that message and vision to both domestic and international audiences—and, importantly, to his own government. To reinforce his words, the president-elect can take the following steps to put climate at the center of U.S. foreign policy: Engage in presidential climate diplomacy. President-elect Biden has demonstrated this commitment to engaging on climate change in his congratulatory calls from foreign leaders. Once in office, he should continue to make clear to foreign governments that the U.S. government will prioritize addressing climate change in all bilateral relationships. He should commit to making climate an ongoing leader-level topic with key global climate players such as China, India, the European Union, and Brazil, and he should include it on his agenda at the G-7, G-20, NATO, and Asia Pacific Economic Cooperation, commonly known as APEC. Appoint senior officials committed to climate action. The president should select senior leadership who embrace this new paradigm and are committed to leading this transformation in U.S. foreign policymaking. His nominees for secretary of state, secretary of the treasury, national security adviser, and director of the national economic council do just that. He should look for those same qualities in his nominees for secretaries of defense and energy, U.S. trade representative, USAID administrator, and ambassadors to China, India, the European Union, and Brazil. Give his special presidential envoy for climate change resources and authority. Former Secretary of State John Kerry’s appointment to the SPE role gives the administration immediate credibility in foreign capitals and a leader with diplomatic experience, substantive expertise, and policy passion. To deliver on this central foreign policy priority, the White House must grant the SPE sufficient authority to lead across the government, mobilizing cabinet agencies to align diplomats and technical experts, as well as development assistance and other policy tools. His seat on the National Security Council is critical for that reason. The secretary of state-SPE relationship will also be critically important. Boost the federal climate budget to meet the crisis. To reinvigorate U.S. diplomatic and development strategies, the president-elect should seek funding from Congress to hire 500 new diplomatic positions and boost U.S. climate-related foreign assistance programs to $25 billion over five years. The Biden administration should use the additional funding to make good on U.S. funding commitments to the Green Climate Fund.10 Reenvisioning U.S. diplomacy and climate change For U.S. diplomacy to deliver on global climate action, State Department leaders will need to work seamlessly with SPE-designate Kerry, as the State Department will be the lead agency responsible for executing the reorientation of U.S. foreign policy to a climate-centric vision. The State Department will also need to partner with and rely on the contributions from a wide range of U.S. economic, development, and technical agencies, but it will be ultimately accountable for delivering results. The success of this reorientation will rely critically on the strategic vision and bureaucratic stamina of the secretary of state, who will face both the urgency to act on the climate crisis and the challenge of driving change to the State Department’s outmoded culture, structure, and incentives, which hamper its capacity to deliver stronger climate action. Secretary of State-designate Antony Blinken’s previous experience as deputy secretary in leading and managing the department would enable him to understand the scope of the challenge and lead the change, if confirmed.11 But change will not happen overnight or without the right mix of incentives and structural support. Setting diplomatic course direction at the State Department The Biden administration can draw useful lessons from then-Secretary of State Kerry’s efforts to elevate climate change as a top foreign policy issue and his attempts to implement cultural and operational change at the State Department. Current Secretary of State Mike Pompeo’s whole-of-department approach on China policy also offers insights and a potential model for climate policy management. Both examples illustrate that for climate change to be central to U.S. foreign policy—and not just a niche issue that may or may not be considered more broadly—State Department leaders will need to fully integrate it into department policy and operations, including by embassies worldwide. The secretary of state and State Department leadership should take the following key steps to elevate and center climate action in the work of the department: Set the secretary’s vision for climate diplomacy. One of Secretary-designate Blinken’s first tasks will be to translate the administration’s broad framing of climate change policy into a strategic vision and operational guidance for U.S. diplomats across the world and in Washington. During the Obama administration, Secretary Kerry’s focus on climate shook up the department’s tradition-bound bureaucracy. In his first months in office, he used the secretary’s traditional first message to U.S. embassies worldwide to issue a very nontraditional directive, declaring that climate action would be a top department priority. He identified core objectives and directed bureaus and embassies to realign resources and effort accordingly—and they did.12 In the department’s 2015 Quadrennial Diplomatic and Development Review, Secretary Kerry declared “mitigating and adapting to climate change” to be one of four department priorities.13 Transformative while he was there, Secretary Kerry’s efforts to lock in the primacy of climate in U.S. foreign policy went dormant after the change in administration. CAP recommends that the new administration take policy and administrative steps to build sustainability of climate as a State Department priority. Engage in secretarial climate diplomacy. The single most important action the incoming secretary can take to elevate and give urgency to climate in U.S. foreign policy is to do so in his own diplomacy. Secretary Kerry put climate change on the agenda in all of his foreign diplomatic engagements. For some engagements, climate was a top, extensive discussion topic. For others, it was a secondary but present issue. He took a direct role in securing the Paris Agreement. The department and embassies quickly adjusted and followed his new policy direction. Domestically, Secretary Kerry was a persistent and effective advocate with the White House, federal agencies, Congress, industry, and civil society to align effort and resources in support of the department’s climate agenda. Make the right senior State Department appointments. The department will need senior leaders who accept the strategic imperative of embedding climate action as a central pillar of foreign policy. The secretary of State, deputy Secretary, and undersecretaries14 will be instrumental in driving this change from the top. But it will be the department’s regional bureau assistant secretaries15 and U.S. ambassadors overseas who will direct U.S. diplomats on whether to take up and act on climate as a priority in the nation’s foreign policy. Their appointments will be critical. Sync climate policy coordination between the secretary of state and SPE Kerry . Clear communication and close coordination between Secretary-designate Blinken and SPE-designate Kerry will be critical for the administration to best leverage the expertise and policy connections of U.S. diplomats, who typically look to their chains of command for instruction. For good, SPE-designate Kerry knows how the department works and how it conducts climate diplomacy, but unity of communication between the secretary’s office and SPE-designate Kerry will be critical for foreign service officers (FSOs) to implement the administration’s climate action agenda with speed and effectiveness. Importantly, it will be the secretary of state and the department’s leadership who will ultimately drive U.S. diplomats to integrate climate change in their conduct of foreign policy. The success of this effort will be key to ensuring that climate action as a department priority is not vulnerable to changes in leadership or administration. China “core policy” offers a model for departmentwide climate policy action. Secretary Pompeo’s mobilization of bureaus and embassies to execute the administration’s China adversary strategy provides an interesting model that the next administration could draw from to unify and direct all department elements to advance its climate change strategy. Secretary Pompeo instructed the deputy secretary to chair a monthly meeting with all bureau assistant secretaries to identify and prioritize specific policy actions and align resources and efforts to act accordingly. The East Asia assistant secretary coordinated departmentwide efforts; each bureau identified a senior official and staff to coordinate China action within the bureau; and each embassy designated China-responsible officers. For example, under the deputy secretary’s direction, relevant regional and technical bureaus coordinated on a worldwide diplomatic strategy to counter China’s commercial 5G buildout by engaging foreign governments, corporations, and other stakeholders to explain the security risks Chinese technology pose to domestic networks.16 For climate purposes, the deputy secretary could adapt this mechanism to coordinate and leverage the efforts of senior State Department officials and ambassadors to engage senior foreign government leaders—particularly at the presidential or prime ministerial level—to address specific climate policy objectives or strategies. That could be at a global level—for example, a global hydrogen research and development strategy—or at a regional level, such as a Gulf states engagement strategy. Administratively, the assistant secretary for Oceans and International Environmental and Scientific Affairs could serve as the department coordinator. Regional bureaus and embassies could create structures to coordinate climate-related work within bureaus and between bureaus and embassies. Climate action on the ground: Ambassadors and embassies The urgency for global action requires the State Department to scrap its past practice of putting U.S. climate diplomacy solely in the hands of Washington-based climate policy experts and instead put its ambassadors, diplomats, and local embassy staff at the forefront of advancing U.S. climate policy in host countries. Climate diplomacy for the early 2020s has a very different charge when compared with the mission during the Obama administration and even earlier. At that time, the State Department was focused on negotiating the new design of an international climate regime, and long-time Washington-based climate experts carried the diplomatic load. FSOs, who often have generalist backgrounds, largely played supporting roles or watched from the side. A smaller team was able to successfully carry out the mission.17 But with the Paris Agreement framework now established, countries are focused on implementing their commitments. Climate policy has pivoted from U.N. negotiations to domestic governance. Governments are deciding development pathways; passing legislation and setting rules; debating economic and energy policies with business and labor; and communicating their climate policy vision to the public. It is at this governance stage where U.S. diplomats—advancing U.S. climate policy with government, business, and civil society—do their best work. To put climate at the center of every embassy’s policy mission, the administration can: Make clear embassy senior leaders’ intent. The president’s letter of instruction to chiefs of mission18 should direct all ambassadors to make climate change a priority issue in their embassies’ work in host countries. Just as the secretary would communicate to the entire department the centrality of climate change, U.S. ambassadors should do the same to embassy staff and in their own diplomacy. Ambassadors should prioritize climate change action appropriately in their Integrated Country Strategy, the strategic and priority-setting policy document for U.S. foreign policy in the host country.19 Institute a whole-of-embassy effort. Economic or science sections traditionally manage U.S. embassies’ climate change diplomacy. But because climate change policy spans the equities of nearly all parts of a typical embassy, the ambassador’s office should lead and direct a holistic approach to the embassy’s policy strategy. Under the deputy chief of mission’s (DCM) direction, for example, the embassy country team should make briefings on embassy actions on climate change a standard agenda item in its regular meeting. Forging a cohesive team that includes State Department economic and public affairs officers; defense attaches; and Foreign Commercial Service, Foreign Agricultural Service, and USAID officers is vital to a successful, full-court press to advance a U.S. climate agenda. Also, U.S. embassies have long benefited from the talent and experience of local professional staff, many of whom previously served in prestigious roles in government, industry, and academia. They are an invaluable resource that embassies should elevate to serve as full partners to advance the U.S. climate agenda. Leverage the diplomatic tool of climate assistance. There have been few more effective tools for U.S. technical agencies and embassies to drive on-the-ground climate policy implementation than the Obama administration’s Global Climate Change Initiative (GCCI), particularly in developing countries. Under the GCCI, the State Department funded the overseas climate-related activities of experts from the U.S. departments of Agriculture, Energy, and the Treasury and the U.S. Environmental Protection Agency,20 who advanced climate policy objectives and built important political and economic connections. The Biden administration should revive and boost GCCI-like activities. As noted above, CAP recommends seeking $25 billion over five years. Launch State Department annual climate country reports. The State Department’s annual Human Rights Country Report is one of the U.S. government’s most powerful instruments for monitoring and potentially driving improved human rights performance around the world.21 An annual State Department Climate Change Country Report could serve a similar catalytic function. Embassies could provide annual updates on host country greenhouse gas emissions; their climate policies and actions; climate adaptation preparedness; transition trends in the power, transportation, and other sectors; and more. Climate country reports could serve to increase transparency of country actions—or inaction and highlight creative solutions. Making climate diplomacy built to last in U.S. foreign relations Nearly all the leadership and management changes recommended in this issue brief are subject to the risk of fading or termination should a subsequent administration take a less urgent approach to climate change. To sustain prioritized climate action, the Biden administration, in any broader State Department reform strategy, should incorporate new measures to ensure climate change is mainstreamed into how the department and the foreign service conduct U.S. foreign relations. The secretary of state and the department leadership team can take administrative measures in the following areas to make “built to last” the goal of embedding climate action into U.S. foreign policy. More people Executing climate action effectively, both under the Biden administration and over the long term, will require many more foreign affairs professionals. The administration should create 500 new foreign service and local U.S. embassy staff positions at the State Department, USAID, the Department of Commerce, and the Department of Agriculture—all dedicated to the international climate brief. An exodus of diplomats in recent years22 might tempt the State Department to direct new officers and resources to traditional foreign policy priority areas. It should resist doing so. Looming global challenges such as climate change require the department to reorient its strategic outlook and resources. More climate-smart people For most foreign affairs professionals, climate change is a subject that is expansive, complex, and new. That can no longer stand. The department should implement training across a range of climate policy functions and at all seniority levels to elevate and sustain climate policy and program management competencies. A departmentwide climate training program should include climate policy familiarization modules at entering-officer orientation, as well as DCM and ambassador courses; required courses on topics such as climate diplomacy, decarbonization policy measures, and climate science for all officers with climate policy responsibilities; and distance learning units on priority climate policy initiatives for all personnel. The department should also offer promising officers one-year external assignments at agencies such as USAID, the Department of Energy, the U.S. Development Finance Corporation, and the U.S. Trade and Development Agency to learn about these agencies’ climate-related tools and capabilities. To realize those training and detail opportunities without compromising the State Department’s operational readiness, the department needs more “float” personnel slots, which the 500 new-hire positions would help make possible. More climate-as-career people The Biden administration can further embed climate change as a core State Department policy priority over time and across changes in administration with changes to organizational incentives that influence the culture of the foreign service.23 Foreign service job assignments and promotion are two areas where the department can act.24 If you were to speak to any FSO, she would tell you that her career path decisions are largely influenced by two incentives: onward job assignments and promotion potential. For any number of historical reasons, the personnel system rewards both in assignments and promotion those officers who specialize in regions—such as Europe, the Middle East, or East Asia—over those who specialize in global or transnational issues, such as climate change, nonproliferation, or refugee matters. To rebalance the system to make climate change a desirable career path for FSOs, the department should take the following actions: Create more embassy climate change jobs. Officers see little foreign service career growth opportunity in climate. At a typical embassy, climate change responsibility is given to one midlevel officer. Supervisors engage on an ad hoc basis, ambassadors and DCMs even less so. The department should create clear career ladder opportunities from midlevel to senior positions, both in Washington and at embassies. Embassies in major capitals should have senior climate officers who lead multiofficer teams. Consider climate performance in foreign service promotion decisions. Given the up-or-out system, all FSOs focus on how a job’s responsibilities and visibility can help them move up the ladder. The foreign service promotion system discourages an officer from considering a climate change assignment or career focused on climate. The system rewards accomplishments that support department-specified priorities, of which climate has long been absent. The department should work with the American Foreign Service Association to add to its promotion precepts a specific expectation that officers demonstrate positive performance on climate to be considered for promotion at each professional level. Reward and recognize climate performance. The department’s servicewide awards program is another signal of the low priority it places on climate change. There are awards for DCM performance, political reporting, consular management, and other areas. There is no department award recognizing foreign service performance on climate change.25 The department should create such an award. Conclusion The majority of Americans expect President-elect Biden to act promptly on climate change, both at home and abroad.26 The gravity of the threat of climate change to the United States and the world requires the Biden administration to make climate change a central focus of U.S. foreign policy, aligning the resources and influence of the United States to help drive global action. The president must lead, but he should put U.S. diplomats and the State Department in the central role for executing this new charge and driving global action. These recommendations should go a long way in enabling them to do so.

#### Biden is currently avoiding disagreements with other WTO members over TRIPS. The plan flips that to create consensus, expending critical diplomatic capital

Day 7-19, Meagan Day is a staff writer at Jacobin. Jacobin, 7-19-21. “Biden Just Turned Down a Golden Opportunity to End Vaccine Apartheid” <https://www.jacobinmag.com/2021/07/biden-administration-covid-19-vaccine-apartheid-global-south-distribution-merkel> brett

The protest on Thursday was organized by a coalition of progressive trade advocacy organizations who object to Merkel’s obstruction of the patent waiver proposal in the World Trade Organization (WTO). The WTO operates by consensus, which means that, in principle, any intransigent party can successfully block the implementation of a policy backed by more than a hundred forty countries. “The protection of intellectual property is a source of innovation and this has to remain so in the future,” Merkel has said in defense of her opposition to the waiver, which would exempt COVID-19 vaccines from the patent protection rules spelled out in the WTO’s Trade-Related Aspects of Intellectual Property Rights Agreement, or TRIPS. To improve global vaccine access, Merkel prefers instead to rely on the COVID-19 Vaccines Global Access initiative (COVAX), a program that has agreements with current vaccine patent holders and would not challenge their intellectual property rights. COVAX caps vaccine doses at 20 percent of a country’s population, and is meant only as a supplement to the ordinary market-based system. Critics say that while it will protect corporate profits, it will be insufficient to end the pandemic worldwide. Merkel’s opposition to a waiver of TRIPS nominally puts her at odds with Biden, who publicly avowed his support for the patent waiver in May. Biden was praised by progressives and censured by the pharmaceutical industry for his position. But now groups who want to see the policy implemented say that Biden isn’t doing enough to convince allies like Merkel and make the idea a reality. The White House meeting on Thursday came and went with no apparent change in Merkel’s position. Biden did not mention the TRIPS waiver in his post-meeting press conference, suggesting either that it was not discussed or that Biden felt no need to publicly pressure Merkel after she privately reiterated her position. Biden and Merkel’s discussion appeared to focus more on Nord Stream 2, a Russian oil pipeline to Germany that Biden worries will give Russia greater influence over the European energy sector and undermine US dominance. He was willing to give airtime to this disagreement, but said nothing about their disagreement over the vaccine patent waiver. “For Merkel to get a high-profile White House victory lap and have Pres. Biden proclaim that she ‘never fails to stand for human dignity’ while Biden has failed to get Merkel to stop blocking the WTO COVID vaccine waiver delivers a punishing blow to efforts to end the pandemic,” said Lori Wallach, director of the group Public Citizen’s Global Trade Watch. “To show global leadership, Biden had to get Germany to stop blocking what he says is a U.S. priority to save tens of millions of lives,” she added. “This summit was a failure.” COVID deaths have risen 40 percent in Africa in the past week alone. Only 1 percent of Africans have been vaccinated, as wealthy nations on other continents have preordered vaccine doses well into the future. Africa’s COVID spike illustrates the urgency of waiving vaccine patents so that global production can scale up immediately, even though to do so would undermine pharmaceutical profits. Every month that passes without a patent waiver, COVID deaths increase in countries without the resources to buy vaccines. So do the chances of viral mutations whose risks won’t necessarily be contained to the Global South. Merkel’s rejection of a TRIPS waiver is a deadly policy rooted in her politics of centrist market liberalism — a politics that, in this case, will result in many more deaths worldwide if not swiftly reversed. Biden just had a chance to take a stand and push for that reversal, but he neglected to spend his political capital pushing the chancellor to get on board with our best shot at ending the pandemic globally. He has taken the right public position on TRIPS, but so far it’s still an open question how serious he is about making it a reality.

#### Diplomatic capital is finite---the plan distracts US focus

Anderson & Grewell 01 Terry L. Anderson is executive director of Political Economy Research Center / J. Bishop Grewell is a research associate with PERC, The Greening of Foreign Policy, Chicago Journal of International Law Fall, 2001 2 Chi. J. Int'l L. 427 (Lexis-Nexis), https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1422&context=cjil

Greater international environmental regulation can increase international tension. Foreign policy is a bag of goods that includes issues from free trade to arms trading to human rights. Each new issue in the bag weighs it down, lessening the focus on other issues and even creating conflicts between issues. Increased environmental regulations could cause countries to lessen their focus on international threats of violence such as the sale of ballistic missiles or border conflicts between nations. As countries must watch over more and more issues arising in the international policy arena, they will stretch the resources necessary to deal with traditional international issues. As Schaefer (2000, 46) writes, “Because diplomatic currency is finite . . . it is critically important that the United States focus its diplomatic efforts on issues of paramount importance to the nation.

#### Warming encompasses AND outweighs every existential threat

Torres 16 (Phil, affiliate scholar @ Institute for Ethics and Emerging Technologies PhD candidate @ Rice University in tropical conservation biology, Op-ed: Climate Change Is the Most Urgent Existential Risk, <http://ieet.org/index.php/IEET/more/Torres20160807>)

Humanity faces a number of formidable challenges this century. Threats to our collective survival stem from asteroids and comets, supervolcanoes, global pandemics, climate change, biodiversity loss, nuclear weapons, biotechnology, synthetic biology, nanotechnology, and artificial superintelligence. With such threats in mind, an informal survey conducted by the Future of Humanity Institute placed the probability of human extinction this century at 19%. To put this in perspective, it means that the average American is more than a thousand times more likely to die in a human extinction event than a plane crash.\* So, given limited resources, which risks should we prioritize? Many intellectual leaders, including Elon Musk, Stephen Hawking, and Bill Gates, have suggested that artificial superintelligence constitutes one of the most significant risks to humanity. And this may be correct in the long-term. But I would argue that two other risks, namely climate change and biodiveristy loss, should take priority right now over every other known threat. Why? Because these ongoing catastrophes in slow-motion will frame our existential predicament on Earth not just for the rest of this century, but for literally thousands of years to come. As such, they have the capacity to raise or lower the probability of other risks scenarios unfolding. Multiplying Threats Ask yourself the following: are wars more or less likely in a world marked by extreme weather events, megadroughts, food supply disruptions, and sea-level rise? Are terrorist attacks more or less likely in a world beset by the collapse of global ecosystems, agricultural failures, economic uncertainty, and political instability? Both government officials and scientists agree that the answer is “more likely.” For example, the current Director of the CIA, John Brennan, recently identified “the impact of climate change” as one of the “deeper causes of this rising instability” in countries like Syria, Iraq, Yemen, Libya, and Ukraine. Similarly, the former Secretary of Defense, Chuck Hagel, has described climate change as a “threat multiplier” with “the potential to exacerbate many of the challenges we are dealing with today — from infectious disease to terrorism.” The Department of Defense has also affirmed a connection. In a 2015 report, it states, “Global climate change will aggravate problems such as poverty, social tensions, environmental degradation, ineffectual leadership and weak political institutions that threaten stability in a number of countries.” Scientific studies have further shown a connection between the environmental crisis and violent conflicts. For example, a 2015 paper in the Proceedings of the National Academy of Sciences argues that climate change was a causal factor behind the record-breaking 2007-2010 drought in Syria. This drought led to a mass migration of farmers into urban centers, which fueled the 2011 Syrian civil war. Some observers, including myself, have suggested that this struggle could be the beginning of World War III, given the complex tangle of international involvement and overlapping interests. The study’s conclusion is also significant because the Syrian civil war was the Petri dish in which the Islamic State consolidated its forces, later emerging as the largest and most powerful terrorist organization in human history. A Perfect Storm The point is that climate change and biodiversity loss could very easily push societies to the brink of collapse. This will exacerbate existing geopolitical tensions and introduce entirely new power struggles between state and nonstate actors. At the same time, advanced technologies will very likely become increasingly powerful and accessible. As I’ve written elsewhere, the malicious agents of the future will have bulldozers rather than shovels to dig mass graves for their enemies. The result is a perfect storm of more conflicts in the world along with unprecedentedly dangerous weapons. If the conversation were to end here, we’d have ample reason for placing climate change and biodiversity loss at the top of our priority lists. But there are other reasons they ought to be considered urgent threats. I would argue that they could make humanity more vulnerable to a catastrophe involving superintelligence and even asteroids. The basic reasoning is the same for both cases. Consider superintelligence first. Programming a superintelligence whose values align with ours is a formidable task even in stable circumstances. As Nick Bostrom argues in his 2014 book, we should recognize the “default outcome” of superintelligence to be “doom.” Now imagine trying to solve these problems amidst a rising tide of interstate wars, civil unrest, terrorist attacks, and other tragedies? The societal stress caused by climate change and biodiversity loss will almost certainly compromise important conditions for creating friendly AI, such as sufficient funding, academic programs to train new scientists, conferences on AI, peer-reviewed journal publications, and communication/collaboration between experts of different fields, such as computer science and ethics. It could even make an “AI arms race” more likely, thereby raising the probability of a malevolent superintelligence being created either on purpose or by mistake. Similarly, imagine that astronomers discover a behemoth asteroid barreling toward Earth. Will designing, building, and launching a spacecraft to divert the assassin past our planet be easier or more difficult in a world preoccupied with other survival issues? In a relatively peaceful world, one could imagine an asteroid actually bringing humanity together by directing our attention toward a common threat. But if the “conflict multipliers” of climate change and biodiversity loss have already catapulted civilization into chaos and turmoil, I strongly suspect that humanity will become more, rather than less, susceptible to dangers of this sort. Context Risks We can describe the dual threats of climate change and biodiversity loss as “context risks.” Neither is likely to directly cause the extinction of our species. But both will define the context in which civilization confronts all the other threats before us. In this way, they could indirectly contribute to the overall danger of annihilation — and this worrisome effect could be significant. For example, according to the Intergovernmental Panel on Climate Change, the effects of climate change will be “severe,” “pervasive,” and “irreversible.” Or, as a 2016 study published in Nature and authored by over twenty scientists puts it, the consequences of climate change “will extend longer than the entire history of human civilization thus far.” Furthermore, a recent article in Science Advances confirms that humanity has already escorted the biosphere into the sixth mass extinction event in life’s 3.8 billion year history on Earth. Yet another study suggests that we could be approaching a sudden, irreversible, catastrophic collapse of the global ecosystem. If this were to occur, it could result in “widespread social unrest, economic instability and loss of human life.” Given the potential for environmental degradation to elevate the likelihood of nuclear wars, nuclear terrorism, engineered pandemics, a superintelligence takeover, and perhaps even an impact winter, it ought to take precedence over all other risk concerns — at least in the near-term. Let’s make sure we get our priorities straight.

## 2

#### Life science innovation high now

Darino et al 20 Lucia Darino, Aaron De Smet, Umar Husain, and Emily Yueh, 10-28-2020, "Reimagining how life sciences work will be done in the next normal," McKinsey & Company, https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/reimagining-how-life-sciences-work-will-be-done-in-the-next-normal#, EH

COVID-19 has accelerated new ways of working in the life sciences industry that have been talked about for years—chief among them a shift to patient and customer centricity, digital interactions, and workforce agility. Almost overnight, R&D teams reprioritized new research, plant and network experts rallied to ensure clinical supply continuity, and go-to-market leaders shifted to enable at-home medical field force. According to data from Netskope—a provider of cloud security services—by the third week of March, around 60 percent of employees started working remotely, up from around 25 percent in the months prior to the COVID-19 outbreak.1 Even now, after some suspended clinical trials have resumed, more than half of the interactions between the lead physician and patients are done virtually, compared with 8 percent pre-crisis..

#### Weaker IP threatens life science innovation

Atkinson 18 Robert D. Atkinson, November 2018, “How the Biopharmaceutical Industry Contributes to Open Scientific Knowledge”, Information Technology and Innovation Foundation, https://www2.itif.org/2018-biopharmaceutical-open-knowledge.pdf?\_ga=2.77597014.392854590.1626928199-819576613.1626677561, EH

In fact, the evidence shows that even with trade secrets and patents—which are critical for enabling drug companies to assume the considerable risks of developing new drugs—a considerable share of biopharma research “spills over” and contributes to knowledge discovery and drug development overall, not just in individual firms’ labs. In fact, these knowledge spillovers are very much like public knowledge generated by government agencies such as NIH. This knowledge dissemination occurs in three main ways: 1) spillovers from company research other researchers are able to learn from; 2) funding by biopharma companies of university research, with most of the results open to researchers around the world; and 3) publication of company discoveries in widely available, open science journals. As such, efforts to impose drug-price controls (or to weaken intellectual property protections) will not only hurt drug innovation in the affected biopharma companies, it will reduce the generation of widely shared knowledge, thus limiting overall life-sciences innovation. THE DISCOVERIES FROM BIOPHARMA COMPANY R&D SPILL OVER When companies invest in R&D to develop a product or a production process, they are almost never able to retain all the benefits of that research, even when they patent the discovery. Competitors and others that learn about the research and discoveries are able to capitalize on them. Economists refer to these external benefits as “spillovers.” Economists have long worked to measure the extent of spillovers from business R&D. As one of the original economists doing this research, Zvi Griliches, wrote, “There has been a significant number of reasonably well done studies all pointing in the same direction: R&D spillovers are present, their magnitude may be quite large, and social rates of return remain significantly above private rates.… The estimated social rates of return look, actually, surprisingly uniform in their indication of the importance of such spillovers.”20 A 1998 study by Jones and Williams computed the social rate of return from business R&D conducted in the United States, and concluded that the optimal level was at least two to four times actual investment.21 The fact that some economists estimate a 7 percent private return and 30 percent social rate of return on R&D suggests the optimal level of R&D investment in the U.S. economy is between three to four times larger than the total current level of private investment.22 When companies do basic research, the spillovers are even greater—as high as 150 percent.23 Okubo and colleagues examined many different studies and determined the private return to be 26 percent and the social return to be 66 percent.24 Most recently, Bloom and Van Reenen examined the change in the rate of R&D spillovers over time, and found spillovers actually increased over the last 40 years, with the ratio of social to private returns increasing from a factor of three to four. They wrote, “There is certainly no evidence that the need to subsidize R&D has diminished.”25 Thus, absent policies that would bring the after-tax rate of private return from R&D closer to the public rate of return—such as through R&D tax incentives—innovations that will improve our lives will come about more slowly. Studies of the biopharmaceutical industry specifically have also found large spillovers. In one study, Henderson and Cockburn found that “a [research] program whose competitors’ programs are in the same and in related fields are roughly 10 percent more productive will be approximately 2 percent more productive itself.”26 In other words, one company’s discoveries cannot be captured completely, even in the presence of trade secrets and patents. Bloom, Schankerman, and Van Reenen also found that there are significant technology spillovers in the pharmaceutical industry. Moreover, they found that spillovers are significantly greater in large biopharma firms compared with smaller ones because the latter “tend to operate in technological ‘niches’” wherein fewer other firms are operating.27 One reason spillovers are large in the biopharma industry is that in the United States their share of R&D classified as basic (14.3 percent) instead of later-stage applied and development is higher than any other U.S. industry—and more than twice as high as the U.S. industry average (6.4 percent).28 Some drug populists, such as economist Joseph Stiglitz, rail against patents for drugs, claiming they limit spillovers and knowledge sharing, and thereby slow the pace of INFORMATION TECHNOLOGY & INNOVATION FOUNDATION | NOVEMBER 2018 PAGE 6 discovery.29 In fact, as we have just seen, studies of the biopharma industry show significant spillovers do exist. Moreover, leaving aside the obvious point that, absent patent protection, there would be much less revenue for biopharmaceutical firms to invest in new drug development (as evidenced by manufacturers of generic drugs investing little in R&D30), patent protection actually enables valuable information sharing. Patents and publicly disclosed patent applications are a very important and valid source of insight for companies seeking to follow the therapeutic leaders. Moreover, the fact that companies can “invent around” a patent invention not only spurs innovation, but also competition. Magazzini, Pammolli, and Riccaboni found that even failed research projects for which patents are filed provide valuable information for companies—including paths not to follow. They found that “patents covering successfully completed projects (i.e., leading to drug launch on the market) receive more citations than those associated to [sic] failed (terminated) projects, which in turn are cited more often than patents lacking clinical or preclinical information.”31 In other words, far from limiting knowledge sharing and innovation, patents actually provide information that is valuable to the research of competitors. FUNDING OF UNIVERSITY RESEARCH There is another way the biopharma industry supports broader knowledge generation. While the industry accounts for 16.8 percent of all U.S. business R&D, it accounts for 61 percent of all business R&D funding of universities.32 For example, many of the U.S. universities that receive the largest share of their R&D support from industry—including Duke, the University of Alabama at Birmingham, University of Texas MD Anderson, and the University of Pennsylvania—have world-leading biomedical research programs.33 There are a number of examples of companies funding university research—as drug innovation relies so heavily on scientific breakthroughs. Companies such as Amgen, GlaxoSmithKline, Novartis, and Vertex have funded research or clinical trials at Duke.34 AbbVie has entered into a partnership with the University of Chicago for cancer research.35 Astellas has provided $26 million to M.D. Anderson Cancer Center in Houston to support treatment for acute myeloid leukemia.36 Novartis has supported more than 300 academic collaborations, such as with Harvard University on the zika virus.37 Pfizer has established its Global Centers for Therapeutic Innovation as an $85 million partnership with the University of California at San Francisco.38 To be sure, NIH provides the lion’s share of academic funding for biomedical research. But in 2016, biopharma companies provided over $2.5 billion in research funding to America’s universities, in all 50 states. As table 1 shows, life-sciences university R&D funding ranges from a low of $366,000 in Maine to a high of $329 million in California. PUBLICATIONS IN OPEN SCIENCE JOURNALS Another indicator of broader spillover and scientific impact comes from bibliometric research of peer-reviewed scholarly articles authored or coauthored by scientists from biopharma firms. Publishing helps spread valuable scientific knowledge. As Tijssen wrote, One reason spillovers are large in the biopharma industry is that their share of R&D classified as basic (as opposed to later-stage applied and development) is higher than any other U.S. industry and is more than twice as high as the U.S. industry average. INFORMATION TECHNOLOGY & INNOVATION FOUNDATION | NOVEMBER 2018 PAGE 7 “This ‘open science’ mechanism produces a pool of knowledge that can be used freely by the international scientific community from which corporate researchers draw very heavily.”39 He could have also accurately added, “and from which corporate researchers contribute to.” Table 1: Higher Education R&D Expenditures Funded by Life-Sciences Businesses: FY 2016 (in Millions)40 State Funding State Funding Alabama $48.6 Montana $1.8 Alaska $0.7 Nebraska $25.0 Arizona $10.4 Nevada $1.2 Arkansas $9.1 New Hampshire $7.2 California $350.9 New Jersey $22.7 Colorado $42.7 New Mexico $2.2 Connecticut $65.4 New York $232.4 Delaware $1.4 North Carolina $315.5 District of Columbia $12.2 North Dakota $0.8 Florida $76.8 Ohio $103.5 Georgia $54.1 Oklahoma $19.0 Hawaii $0.7 Oregon $27.2 Idaho $1.2 Pennsylvania $165.3 Illinois $96.6 Rhode Island $2.3 Indiana $37.1 South Carolina $25.3 Iowa $29.8 South Dakota $0.8 Kansas $17.0 Tennessee $41.4 Kentucky $17.1 Texas $186.1 Louisiana $24.3 Utah $27.6 Maine $0.6 Vermont $3.2 Maryland $88.9 Virginia $36.4 Massachusetts $75.0 Washington $43.5 Michigan $52.4 West Virginia $10.0 Minnesota $26.1 Wisconsin $27.5 Mississippi $11.1 Wyoming $0.5 Missouri $87.4 At first glance, it may seem odd that biopharma firms publish in peer-reviewed science journals when intellectual property protection is the key to their ability to continue to innovate—and writing for these publications takes valuable time away from industry researchers. Scholars have suggested several reasons why. Hicks has averred that firms publish in order to “participate in the barter-governed exchange of scientific and technical For decades, biopharma firms have been contributing to the world’s knowledge stock by giving paper presentations at scientific conferences and publishing in peer-reviewed scholarly publications. INFORMATION TECHNOLOGY & INNOVATION FOUNDATION | NOVEMBER 2018 PAGE 8 knowledge.” In other words, when all or most firms participate, they benefit from each other’s work. And by publishing, firms send signals that they are “contributing to the pool of knowledge,” and therefore should be able to access that knowledge.41 As Rafols, et. al., wrote, “Adopting an Open Science strategy is in this case considered necessary in order to connect to the scientific community and to access its resources in the form of knowledge, qualified labour and informal advice.”42 Similarly, Haeussler found that biopharmaceutical industry researchers share data with university colleagues, basing “their decision to exchange information on factors related to social capital and choose to share data with colleagues when the danger of it being appropriated is low and the prospect of reciprocity is high.”43 The industry also appears to publish more than other industries. The largest number of partnerships between corporations and academic institutions in the Nature Index in 2016 was in the life sciences, with 13,114 collaborations.44 One reason is intellectual property protection. By obtaining patents for their drugs, companies are more assured their valuable discoveries will be protected, thus rendering the risk of direct copying from information being shared in scholarly journals less than would otherwise be the case. For decades, biopharma firms have been contributing to the world’s knowledge stock by giving paper presentations at scientific conferences and publishing in peer-reviewed scholarly publications. As Henderson and Cockburn wrote in 1996, “The [biopharma] industry is characterized by high rates of publication in the open scientific literature, and many of the scientists with whom we spoke stressed the importance of keeping in touch with the science conducted both within the public sector and by their competitors.”45 A comprehensive review of scholarly publications involving the 16 largest pharmaceutical companies in Europe and the United States showed how widely their scientists are involved in knowledge dissemination.46 European firms, many of which have substantial R&D and production facilities in the United States, were involved in more than 84,800 scholarly journal publications from 1995 to 2009; American firms more than 78,000. The authors estimated that this accounted for about 4 percent of all scientific journal articles in the field. They found articles to be particularly focused on Pharmacology and Pharmacy, Biochemistry, and Molecular Biology; but also on Chemistry, including Organic Chemistry and Medicinal Chemistry; and Immunology and Infectious Diseases, areas of Clinical Medicine (for example, surgery, hematology, and dermatology). Most of these papers address core scientific issues. For example, according to a paper published in the Journal of Biological Chemistry, “A group of Genentech scientists described a type of engineered antibody that is both easier to manufacture and, potentially, reduces certain types of toxicities in animals and humans.”47 These papers are also mostly collaborative, involving coauthorship with researchers from other organizations, often universities. For example, Novartis and Harvard published 83 joint research articles from 2012 to 2016 in leading scholarly journals, including the Proceedings of the National Academy of Sciences, Nature, Cancer Cell, and Nature Medicine. 48 This reflects the basic research-driven nature of the industry and the extensive partnerships INFORMATION TECHNOLOGY & INNOVATION FOUNDATION | NOVEMBER 2018 PAGE 9 between academic research institutions and biopharma firms, as previously noted. And in many cases, the company contributes to more than 90 percent of the authorship of the articles. 49 In order to measure the number of scholarly journal articles biopharma companies were involved in as authors or coauthors, the Information Technology and Innovation Foundation (ITIF) used a tool from Microsoft to search for scholarly academic articles with industry authorship.50 We examined the top 93 companies that, in 2016, accounted for 76 percent of global life science R&D. In 2017, researchers from these companies were authors or coauthors of 12,792 papers, up from 8,322 in 2007—an increase of 54 percent. This worked out to 116 articles for every $1 billion of R&D invested, and 8.8 articles per 1,000 employees. The top five companies in terms of articles were Novartis with 1,249, AstraZeneca (1,072), Pfizer (1,007), Merck (U.S.) (995), and Roche (942). To be sure, this is less than the number and rate of articles coming from NIH funding. In 2017, there were approximately 95,000 peer-reviewed journal articles by researchers who had received NIH funding for their work. But given that the vast majority of NIH recipients are academic scholars whose bread and butter are peer-reviewed journal articles, it is not surprising this number is as high as it is. What is perhaps more surprising is that the industry numbers are 13.4 percent of NIH’s numbers. Finally, in addition to funding university research, many biopharma firms are also participating in open consortia designed to develop and disseminate discoveries, including open data. For example, the Open Pharmacological Concepts Triple Store (Open PHACTS) involves a number of companies—including Merck, Novartis, and Pfizer—and universities working to develop and link diverse and complementary drug discovery databases to support drug research.51 Similarly, companies such as AstraZeneca, Novartis, GSK, Pfizer, Sanofi, and Takeda have funded the Neglected Diseases Initiative to provide a platform for collaborative, nonprofit drug discoveries.52 POLICY IMPLICATIONS Notwithstanding the spillovers and other knowledge dissemination biopharmaceutical company R&D supports, more can be done to increase biopharma innovation and knowledge generation. Clearly, working to protect robust intellectual property protections, including data exclusivity for biologics, and fighting against drug-price controls—especially in foreign nations—is important, as it ensures companies can earn the revenues they need[ed] to invest in the next generation of drug discovery. 53 But other steps are also needed. One important step is to expand the R&D credit. As previously noted, the difference between public and private rates of return is significant; and the core policy reason the United States adopted the world’s first R&D credit in 1983 was to reduce the difference between these rates. Given the still-significant difference, Congress should at least double the rate of the Alternative Simplified Credit from 14 percent to 28 percent. Many would protest that, given its sizeable budget deficit, the United States cannot afford this. In addition to funding university research, many biopharma firms are also participating in open consortia designed to develop and disseminate discoveries, including open data. INFORMATION TECHNOLOGY & INNOVATION FOUNDATION | NOVEMBER 2018 PAGE 10 But ITIF research shows that such an expansion would more than pay for itself in net present value terms thanks to faster economic growth.54 In other words, on a dynamic scoring basis, the expanded credit would generate a net present value rate of return to government tax revenues in excess of the direct tax credit cost. In addition, both the regular credit and the ASC versions of the R&D tax credit treat funding companies provide to universities less generously than research funding they do inhouse. Under both credits, firms can claim a credit against only 65 percent of payments made to institutions for basic research (such as universities). This is the exact opposite of what is economically rational. Therefore, Congress should eliminate language in the tax code that restricts the definition of basic research to projects “not having a specific commercial objective.” Congress should also expand the collaborative research credit. Industry funding of university research tends to focus on more basic and exploratory research—which have bigger spillovers—with many of the benefits going to other firms, and society at large. However, firms do less of this kind of research than is economically optimal, which is why a number of other countries, including Canada, Denmark, Hungary, Japan, France, Norway, Spain, and the United Kingdom have, in the last decade, established more generous incentives for this form of research.55Congress should modify the existing collaborative R&D credit, which provides a 20 percent flat credit for collaborative R&D for energy research only, by eliminating the energy restriction. CONCLUSION Biomedical innovation is critical to addressing human health challenges. And a healthy life sciences innovation system depends on robust public and private funding of biomedical R&D.56 Public support for biomedical innovation is defended in part on the grounds that much of the information is in the public domain and can be used by a wide range of innovators. At the same time, a number of drug populists and budget hawks argue that governments should impose or increase price controls on drugs, and that doing so will have little negative effect on new drug development. However, as this paper has shown, not only are drug companies’ revenues highly correlated with the amount of R&D they invest in, but much of the R&D they fund spills over both to other firms and to the public domain, thereby helping to spur even more life-sciences innovation. Price controls and other steps to reduce revenues, such as weaker intellectual property protections, will mean less knowledge generation and sharing, which will leave with the next generation with drugs that will be less effective than would otherwise be the case.

#### Life science innovation critical to power projection and national security

Inglesby and Poste 11 Preserving National Security: The Growing Role of the Life Sciences, Thomas V. Inglesby, the director and chief executive officer of the Center for Biosecurity of UPMC, George Poste, Chief Scientist, Complex Adaptive Systems Initiative, Arizona State University, 3/3/2011, http://www.centerforhealthsecurity.org/our-work/events/2011\_growing\_role\_of\_lifesciences/growing\_role\_life\_sci\_conf\_rpt.pdf, EH

Life Sciences Rising Conference goals. In his opening remarks, Dr. Inglesby established the goal of the conference—to discuss the impact of the life sciences on national security—and outlined recent developments and challenges in the life sciences. He noted that the Obama Administration recognized the unparalleled period of advancements in life sciences in the National Strategy for Countering Biological Threats (December 2009), which states that continued research and development in the life sciences is essential. Importance of the life sciences to national security. Dr. Inglesby said that for the purposes of this discussion, national security is the security, prosperity, and survival of the country through the use of military might, economic power, diplomacy, energy security, and emergency preparedness against terrorism and natural catastrophes. Life sciences play a key role in each of these endeavors. Some of the breakthroughs of the past year give a sense of the fundamental discoveries emerging from the life sciences: self-replicating, genetically designed life; early diagnosis of Alzheimers; new rapid diagnosis of TB; faster and cheaper genome sequencing technologies; novel techniques to reprogram cells to perform new functions; depictions of the dark genome; and the unlocking of the microbiome. The role of the life sciences in the American economy is expanding: 1.3 million Americans are employed in life science– related fields, and that number will only grow. As per Rob Carlson’s work: the biotechnology industry alone represents $200-$250 billion in annual revenue, 2% of the GDP, with 20% growth per year. On the other hand, there are concerns about the U.S. ability to sustain its competitiveness in life sciences research and development and concerns about the increasing time it takes to develop and approve new medicines, especially in the face of impending cuts to the NIH budget in FY2011. Key questions. Dr. Inglesby encouraged participants to consider several key questions, the answers to which, he suggested, should drive policy and action to clarify the role of the life sciences in preserving national security: • What is the overall impact of the life sciences on national security? • What are important trends in the life sciences and their impact on national security and the economy? • What are the priorities of U.S. government programs in the life sciences field? • What should the U.S. do to maintain competitiveness in the life sciences? • What is the role of the life sciences in diplomatic efforts? • What can the U.S. do to better realize the many contributions of the life sciences? The Impact of Life Sciences on National Security When Dr. Poste opened his talk, he told the audience that he intended to be provocative, and provocative he was. Dr. Poste conveyed how the life sciences are intersecting with our security, from dangerous antibiotic-resistant pathogens that are now making the hospital “the most dangerous place on earth,” to convergent technologies that are making cognitive and genetic enhancement possible. Dr. Poste made the case that the national security landscape is changing because of vulnerabilities posed both by new life science technologies and by military applications of life technologies. What is the role of the U.S. in this rapidly evolving future? Dr. Poste said that while he still believes the U.S. is the greatest and most technologically advanced nation on earth, he is, for the first time in his 40 years in the U.S., worried about the nation’s ability to maintain dominance in the future. Speaker Thomas V. Inglesby Speaker George Poste

#### Heg stops global nuclear war

Zalmay Khalilzad 16, former U.S. ambassador to the United Nations, counselor at the CSIS, 3/23/16, “4 Lessons about America's Role in the World,” http://nationalinterest.org/feature/4-lessons-about-americas-role-the-world-15574?page=show

Ultimately, however, we concluded that the United States has a strong interest in precluding the emergence of another bipolar world—as in the Cold War—or a world of many great powers, as existed before the two world wars. Multipolarity led to two world wars and bipolarity resulted in a protracted worldwide struggle with the risk of nuclear annihilation. To avoid a return such circumstances, Secretary of Defense Dick Cheney ultimately agreed that our objective must be to prevent a hostile power to dominate a “critical region,” which would give it the resources, industrial capabilities and population to pose a global challenge. This insight has guided U.S. defense policy throughout the post–Cold War era. Giving major powers the green light to establish spheres of influence would produce a multipolar world and risk the return of war between the major powers. Without a stabilizing U.S. presence in the Persian Gulf and U.S. relationships with Jordan and the Gulf States, Iran could shut down oil shipments in its supposed sphere of influence. A similar scenario in fact played out during the 1987 “tanker war” of the Iran-Iraq war, which eventually escalated into a direct military conflict between the United States and Iran. Iran’s nuclear program makes these scenarios even more dangerous. The United States can manage the rise and resurgence of great powers like China, Russia and Iran at an acceptable cost without ceding entire spheres of influence. The key is to focus on normalizing the geopolitics of the Middle East, Europe and the Asia-Pacific, which the United States can do by strengthening its transatlantic and transpacific alliances and adapting them to the new, dangerous circumstances on the horizon. The United States should promote a balance of power in key regions while seeking opportunities to reconcile differences among major actors.

## 3

#### CP Text: the member nations of the World Trade Organization should

* The United States should publicly renounce its support for any COVID TRIPS waivers.
* Remove restrictions on vaccine exports
* Reduce remaining tariffs and streamline non-tariff measures to trade in vaccines
* Increase international co-operation and co-ordination

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All **countries need vaccines but not all can produce them. Vaccine production is highly specialised, subject to comparative advantages, and concentrated in few countries**, making **trade a vital means to deploying vaccines broadly**. Keeping markets open by reducing tariffs, streamlining trade-related processes at and behind the border while ensuring better co-ordination of logistical processes will be key to ensuring timely access to vaccines for all. This note discusses trade and **trade policy considerations underpinning access to the final and intermediate goods needed to effectively produce**, deliver and administer **COVID-19 vaccines**. It focuses on the international aspects of the vaccine supply chain, discussing the sourcing, production, distribution and need to expedite international border crossing and transportation (including in the context of the cold supply chain). Announcements on the efficacy of emerging COVID-19 vaccines have provided a glimmer of light at the end of the tunnel. However, mass manufacturing and distribution of vaccines will continue to pose challenges. An analysis of the international aspects of the vaccine supply chain shows that. All countries need vaccines, but not all are able to produce them. Vaccine production is highly specialised and subject to comparative advantages. **Trade will therefore play a key role in enabling access to COVID-19 vaccines, especially for developing countries**. **There are strong trade interdependencies in the goods needed to produce, distribute and administer vaccines**. Besides the active ingredients needed to produce vaccines, distribution and administration requires access to goods produced across a range of countries: vials to move the vaccines, syringes to administer, cold boxes to transport, dry ice to maintain cold temperatures, and freezers to store. The production of COVID-19 vaccines is likely to be geographically concentrated, but the demand is global. Distributing vaccines poses significant logistical challenges that could be addressed by: Promoting online communications hubs to share information on existing manufacturing facilities and connecting potential distributors. Keeping markets open. Despite strong trade interdependencies, **tariffs on vaccines and key inputs remain and will negatively impact the ability to get vaccines to where they are needed**. Duties on vaccines exist in 22% of economies, with 8% applying duties above 5%. Average world tariffs on vaccine ingredients such as preservatives, adjuvants, stabilisers, antibiotics range between 2.6% and 9.4%. **It will also be important that countries avoid export restrictions on both intermediate and final goods to ensure vaccines can be effectively distributed. Increasing international co-operation and co-ordination to enable vaccines to move seamlessly across borders. Focus might be best placed on streamlining processes at the border, ensuring better co-ordination of logistical processes, and relaxing, where possible and without prejudice to safety, trade-related regulatory burdens**. Ensuring access to the medical equipment and related goods needed to fight COVID-19 was an immediate challenge during the first wave of the pandemic. Analysis revealed that no country was able to efficiently produce all the goods needed to fight the virus, highlighting the high degree of trade interdependencies between countries (OECD, 2020[1]). During the second wave, promising announcements by Pfizer-BioNTech, Moderna, and Astra-Zeneca/Oxford University on the efficacy of vaccines in development, and subsequent publications of clinical trial results and marketing authorisations for these products in several OECD countries, have provided a glimmer of light at the end of the tunnel. Here too, trade will play a key role in enabling mass production and distribution of vaccines across the globe (WTO, 2020[2]). Vaccine manufacturing is a sophisticated process that requires access to specialised equipment and inputs, storage facilities, and highly skilled labour. Trade data can provide useful insights into the supply and demand conditions that existed for vaccines prior to COVID-19, thereby helping to identify the production capacities and existing trade infrastructure that can be exploited for the distribution of new vaccines. Vaccines (for human use) are classified under a single Harmonised System (HS) code (300220).[1](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z2) This facilitates the analysis of broad supply and demand conditions, albeit at the expense of more detailed information on which vaccines are traded by which countries. The most **recently available trade data reveal that while vaccines are imported by most countries around the globe, they are in relative terms exported by few countries**([Figure 1](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e160)).[2](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z3) Vaccines are imported by 208 economies (relative to other products, vaccines are in the 6th percentile in terms of the total number of importing countries); whereas they are exported by 90 economies (relative to other products, vaccines are in the 35th percentile in terms of total number of exporting countries). All countries need vaccines but not all are able to produce them. There is significant concentration in the exports of vaccines. The top 10 exporters account for 93% of global export value (80% in terms of volume). Ireland is the top exporter by value, accounting for 28% of global exports, followed by Belgium (which is the top exporter by volume) representing 21%[3](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z4) ([Figure 2](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e251)). Rankings of export volumes differ from value rankings, revealing significant heterogeneity in unit prices across suppliers. Imports are, in relative terms, less concentrated in both value and volume although the top 10 importers still represent 72% of global import values (69% in terms of volume). The United States is the top importer with 24% of global imports, followed by Belgium with 22% of global imports (Figure 2b).[4](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z5) Developing economies depend on high-income countries for vaccines. The European Union (EU) is the main source of vaccine imports for all regions. In particular, South Asia and Sub-Saharan Africa import more than two-thirds of their vaccines from the European Union (Annex A). East Asia and South Asia are nevertheless increasingly becoming a source of vaccines for other developing regions. Countries with higher per capita GDP export vaccines having higher unit values, suggesting that richer countries specialise in higher-end, more complex vaccine production (Annex A). However, in terms of imported vaccines there is less dispersion in unit values.[5](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z6) This indicates strong specialization patterns along comparative advantages: countries will specialise in the production of some types of vaccine but use imports to access others.[6](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z7) The safe and timely delivery of vaccines depends on the efficiency of the supply chains that underlie their production and distribution. Although each vaccine will involve different components, the vaccine supply chain can be broken down into three, and sometimes four, key steps (depending on the vaccine) ([Figure 3](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e363)). The first is the *drug discovery process*, the second *mass production*, the third *distribution and administration*, and the last the *reverse logistics* (in the event that products such as cool boxes need to be returned). Different stages of this supply chain will be located in different countries. Indeed, while mass production might be geographically concentrated, many of the ingredients needed in production or for primary and secondary packaging will come from different sources. **This means that trade** will play an **important role in enabling mass production, distribution, and administration of vaccines**. **Vaccine production** involves a complex **range of steps that require not only significant up-front investment in R&D (WTO, 2020[2]), but also in selecting suppliers of key ingredients, setting up manufacturing processes**[**7**](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z8)**and quality checks, and sourcing primary and secondary packaging**. Each vaccine has specific active components (the antigen) that generate different immune responses. Some contain an inactivated form or component of the disease-causing organism; in the case of some of the novel COVID-19 vaccines, a blueprint enables the intercellular production of the antigen.[8](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z9) The latter will determine the manufacturing process and the type of production facility that is needed. Vaccine production requires more than the core ingredients, however. Vials and rubber stoppers are needed to store the vaccines, cold boxes to transport[9](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z10) them, and dry ice to keep these at appropriate temperatures. Drawing on trade data and product codes identified by the Asian Development Bank (ADB),[10](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z11)[Figure 4](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e465) highlights the diverse origins of the ingredients and goods needed to produce, distribute and administer vaccines, from adjuvants to vials. As was the case with the goods needed to fight COVID-19 (OECD, 2020[1]), trade data reveal a high degree of trade interdependence in the goods needed to produce, distribute and administer vaccines. The distribution of vaccines will also require the use of specialised warehousing, different modes of transport, and last-mile delivery. Once distributed, **vaccines** will **require qualified personnel and a range of goods to store (freezers) and administer (syringes, needles and vials)**. Lastly, and particularly for vaccines that require a specialised cold supply chain, some of the secondary packaging will need to make its way back so that it can be re-used. Leveraging existing manufacturing capacity to meet global COVID-19 vaccination goals will require moving goods into factories and transporting finished products to their final destination. Existing evidence on production capacity is scarce, especially in light of the uncertainty on which vaccine(s) will be administered the most extensively. Survey results from the Coalition for Epidemic Preparedness Innovations (CEPI) highlight that potential manufacturing capacity is concentrated in a few high income and emerging economies, with the United States, the People’s Republic of China (hereafter “China”), and India being the largest potential producers. These are followed by several economies in the European Union, Australia, Brazil, Canada, the Russian Federation, and the United Kingdom (CEPI, 2020[3]).[11](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z12) Visualising the location of potential COVID-19 vaccine manufacturers and distributors ([Figure 5](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e594)) confirms this, and highlights the strong degree of concentration of producers and distributors in high income and emerging economies (ADB, 2020[4]). Few firms are registered as vaccine distributors in South America or Southeast Asia, and no producer or distributor firms are registered in Africa and Central Asia[12](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z13) ([Figure 5](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e594)).[13](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z14) This geographical concentration underscores the importance of trade links for the production and supply of COVID-19 vaccines, and the logistical challenge of supplying vaccines globally. Vaccines will need to be shipped from relatively few locations to individuals across the entire globe. Ensuring their timely delivery and maintaining them at adequate temperatures would favour air freight as mode of delivery. However, belly cargo capacity continues to be constrained.[14](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z15) Recent data proxy for cargo availability shows that for most trade lanes, air cargo capacity was between 2% and 50% lower in Q4 2020 as compared to the same period in 2019 ([Figure 6](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e624)) (IATA, 2021[5]). Monitoring specific air cargo capacity available across main trade routes will be key to enabling the effective supply of vaccine ingredients to manufacturers and the distribution of finished vaccines and ancillary equipment. Many of the most impacted trade lanes are those that might be significant in distributing COVID-19 vaccines and related ingredients (e.g. Asia, Europe, and North America exporting to other regions such as Asia-Pacific, Middle East, Central and South America, and Sub-Saharan Africa) (IATA, 2021[5]). Constrained capacity directly relates to higher air freight costs, and prioritisation of COVID-19 vaccines is also likely to have displacing effects on other trade that travels via air. Tariffs are unlikely to pose major challenges to the vaccine distribution efforts overall: the simple average world tariff on vaccines is 0.76% ([Figure 7](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e681)) – about one-tenth of the average tariff imposed on total trade (7.1%). Out of 183 countries, four-fifths apply zero duties.[15](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z16)This still means that one-fifth of countries have positive duties on vaccines, with 8% having a duty equal to or greater than 5%. So while tariffs are less likely to pose major challenges, additional steps could be taken to ensure that vaccines meet zero duties in all countries. Higher tariffs remain on vaccine-related inputs, increasing the final price. For instance, average world tariffs on vaccine ingredients such as preservatives, adjuvants, stabilisers, antibiotics range between 2.6% and 9.4%. Tariffs on materials to administer vaccines, such as syringes and needles, are in a similar range (4.4% and 4.5%). Tariffs for primary packaging (e.g. vials and stoppers) or distribution materials (such as cold boxes, freezers, or dry ice) can go up to 12.7%. Pharmaceutical products and organic chemicals, which include vaccines as well as a number of their ingredients, are among the products that attract the highest number of non-tariff measures (NTMs). In OECD countries, these two sectors must comply with on average around 38 and 29 different NTMs respectively – mainly in the form of technical barriers to trade (TBT), sanitary and phytosanitary measures (SPS), price-control measures, and import licensing measures ([Figure 8](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#figure-d1e730)).[16](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z17) While some of these standards and regulations can reduce information asymmetries and strengthen confidence in imported products (Cadot, Gourdon and van Tongeren, 2018[8]), they also translate into compliance costs and controls at the border. These regulations are undoubtedly important to protect the health and safety of citizens, but there may be areas where unnecessary duplication or cumbersome processes exist. Mapping the relevant regulatory requirements, processes, and approvals for access to different markets will therefore be key to enabling more efficient vaccine distribution and reducing unnecessary trade costs. Trade facilitating measures introduced at the height of the COVID-19 pandemic have helped streamline border processes for pharmaceutical and medical goods (OECD, 2020[9]) (Evenett et al., 2020[10]). These can continue to be useful tools for expediting border clearance for vaccines and related ingredients, including the “green lanes” or “corridors” for fast clearance (e.g. those introduced at intra-EU borders), electronic submission of documents for pre-arrival processing, simplified import and export declaration forms, and extended business hours at specific border posts. They will be important not just to facilitate border clearance for vaccines, but also for the inputs needed to manufacture, distribute, and administer them.[17](https://www.oecd.org/coronavirus/policy-responses/using-trade-to-fight-covid-19-manufacturing-and-distributing-vaccines-dc0d37fc/#endnotea0z18) Co-operation and co-ordination between Customs and other relevant agencies need to be improved to streamline processes at the border. Continuing to invest in digital infrastructure to support the use of automated tools such as electronic pre-arrival processing and electronic data exchange between relevant border agencies can play an important role in improving co-operation mechanisms and risk management. This would allow border agencies to better respond to actors along the vaccine supply chain on the release status of goods through electronic channels within strictly defined time limits (Global Express Association, 2020[11]). Logistics operators show different degrees of preparedness, highlighting the need for more co-operation with and amongst the private sector. For instance, ground handlers and airport operators feel they are less prepared than do forwarders and airlines (Pharma-Aero/TIACA, 2020[12]). Top concerns revolve around managing the necessary infrastructure (facilities, cold chain ground equipment, containers, etc.), supply chain transparency on shipment transport conditions, transportation time, and customs clearance. According to IATA, up to 20% of temperature-sensitive pharmaceutical products are already damaged at arrival because the cold chain was disrupted during transport (IATA, 2015[13]). The specificities of transporting vaccines – e.g. some types of refrigerants are classified as dangerous goods and the reverse logistics needed to return cold chain equipment – also require attention. A wide range of uncertainties remain in manufacturing and distributing COVID-19 vaccines across the globe. These include: the variety of inputs needed; the manufacturing capacity and pace of production; the roll-out schedules for administering vaccines; the requirements for transport and storage; and the availability of cargo. These uncertainties affect the ability to make decisions and reduce the level of preparedness. This note highlights the **importance of trade in the effort to produce, distribute, and administer vaccines. As not all countries can produce these, trade enables access to vaccines and to their key ingredients,** as well as to the goods needed for their distribution and administration. In the face of **existing uncertainties, trade needs to provide an environment that is conducive to broader vaccine distribution by: Reducing remaining tariffs and streamlining non-tariff measures to trade in vaccines, key related ingredients in their production, and the goods needed to safely distribute and administer these**. **Avoiding export restrictions to ensure the effective functioning of supply chains and the distribution of vaccines globally, in light of the concentration of input sourcing and vaccine manufacturing capacities.** Increasing co-operation within and between Customs and other relevant agencies with a view to expediting processes at the border, ensuring better co-ordination of logistical processes, and relaxing, where possible and without prejudice to safety, trade-related regulatory burdens. The continued implementation of the WTO Trade Facilitation Agreement (TFA) is essential to streamlining border processes, while specific logistics and border challenges could be addressed through public-private consultation structures such as National Trade Facilitation Committees. This would include investing in the adoption of digital infrastructures and processes. Improving transparency and information sharing across the entire value chain to enable the different actors to find each other and enable more efficient production and distribution via trade channels. This could be achieved through the use and promotion of online information hubs, such as those undertaken by the Asian Development Bank (ADB).

# Case

#### T/L on case—both contentions are based on solving covid—proving they don’t solve is sufficient to negate

#### Their Meldrum and Cheng says that companies are hampered by IP and other restrictions—that’s a direct line from the card which proves there's alt causes

## C1

#### 1] Their Jecker card says there’s massive room for supply increase but their solvency says nothing about that—they read zero cards explaining why reducing IP increases supplies

#### 2] They don’t solve equal vaccine distribution—their solvency is abt the WHO tech transfer hub but they don’t read ev saying why that’s key

#### 3] Turn—aff causes higher costs and prevents distribution.

**McMurry 8/18** [Michelle McMurry-Heath Aug. 18, 2021, 8-18-2021, "Waiving intellectual property rights would harm global vaccination," STAT, <https://www.statnews.com/2021/08/18/waiving-intellectual-property-rights-compromise-global-vaccination-efforts/>] EH

The resurgence of Covid-19 cases in the United States and around the world, in large part due to the highly transmissible Delta variant, makes it even more crucial to step up the pace of the global vaccination campaign. To do that, some countries have sought to suspend intellectual property (IP) protections on Covid-19 vaccines and therapies. India and South Africa [sponsored a proposal](https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669.pdf&Open=True) to that effect at the World Trade Organization (WTO). The proposal has since [been endorsed](https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669R1.pdf&Open=True) by other countries, [including the United States](https://www.statnews.com/2021/05/06/waiver-of-patent-rights-on-covid-19-vaccines-in-near-term-may-be-more-symbolic-than-substantive/). They argue that eliminating IP protections would allow any willing company to produce lifesaving Covid-19 vaccines, making them cheaper and more widely accessible in low-income nations. If true, that would be a compelling argument. But it isn’t. Covid-19 vaccines are already remarkably cheap, and companies are offering them at low or no cost to low-income countries. Poor access to clinics and transportation are barriers in some countries, but the expense of the shot itself is not. In fact, if the World Trade Organization grants the IP waiver, it could make these vaccines more expensive. Here’s why. Before Covid-19 emerged, the world produced at most [5.5 billion doses](https://www.barrons.com/articles/a-plan-to-break-the-vaccine-manufacturing-bottleneck-51621952245) of various vaccines every year. Now the world needs an additional [11 billion doses](https://www.who.int/director-general/speeches/detail/director-general-s-opening-remarks-at-the-g7-summit---12-june-2021) — including billions of doses of mRNA vaccines that no one had ever mass-manufactured before — to fully vaccinate every eligible person on the planet against the new disease. Even as Covid-19 vaccines were still being developed, pharmaceutical companies began retrofitting and upgrading existing facilities to produce Covid-19 vaccines, at a cost of [$40 to $100 million each](https://www.americanprogress.org/issues/healthcare/reports/2020/07/28/488196/comprehensive-covid-19-vaccine-plan/). Vaccine developers also licensed their technologies to well-established manufacturers, like the Serum Institute of India, to further increase production. As a result, almost every facility in the world that can quickly and safely make Covid-19 vaccines is already doing so, or will be in the next few months. The cutting-edge mRNA vaccines from Moderna and Pfizer-BioNTech face an even bigger capacity issue. Since the underlying technology is new, there are no mRNA manufacturing facilities sitting idle with operators just waiting for licensing agreements to turn on the machines. Nor are there trained personnel to run them or ensure safety and quality control. Embedding delicate mRNA vaccine molecules inside lipid nanoparticle shells at temperatures colder than Antarctica isn’t as easy as following a recipe from Bon Appetit. Another big barrier to producing more shots is a shortage of raw materials. Suspending intellectual property protections and allowing any manufacturer to try to produce these vaccines, regardless of preparedness or experience, would increase the demand for scarce raw materials, driving up prices and impeding production. Nor could all companies that suddenly get a green light due to suspended intellectual property rights produce vaccines as cheaply or quickly as existing manufacturers. Building a new vaccine manufacturing facility costs about $700 million, takes many months — if not years — to build and, once opened, requires another [four to six months](https://www.americanprogress.org/issues/healthcare/reports/2020/07/28/488196/comprehensive-covid-19-vaccine-plan/) to start producing vaccine doses. And because negotiations surrounding the WTO waiver, which began this summer, could take until December before they are completed, it wouldn’t be until well into 2023 or later that any additional doses would become available. That’s slower than our current production rate. According to a report from Duke University’s [Global Health Innovation Center](https://launchandscalefaster.org/covid-19/vaccinemanufacturing), companies are on track to manufacture enough shots in 2021 to fully vaccinate at least 70% of the global population against Covid-19 — the level required to achieve herd immunity. Covid-19 vaccines are saving millions of lives and protecting trillions of dollars of economic activity for an exceptionally low cost. Israel, for example, which has one of the world’s highest vaccination rates, paid [$23.50 per dose](https://www.timesofisrael.com/israel-said-to-be-paying-average-of-47-per-person-for-pfizer-moderna-vaccines/) for early shipments, for a total of about $315 million. That’s approximately equal to the gross domestic productivity losses incurred during [just two days of shutdowns](https://www.bmj.com/content/372/bmj.n281) in the country. Many countries are buying shots for under $10 per dose. India and South Africa — the two countries leading the petition to gut IP rights — are paying just $8 and $5.25 per dose, respectively. For reference, a regular flu shot costs about $14 in the United States, and pediatric vaccines average about $55 per dose. Meanwhile, low-income countries that can’t afford even modest prices are getting their vaccines at no charge. [COVAX](https://www.who.int/initiatives/act-accelerator/covax), the international nonprofit vaccine distributor, aims to deliver 2 billion doses to developing nations by the end of the year. President Biden vowed to make America the world’s [“arsenal of vaccines.”](https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/05/17/remarks-by-president-biden-on-the-covid-19-response-and-the-vaccination-program-4/) The U.S. has already committed $4 billion to COVAX, has donated more than 100 million vaccine doses abroad, and is on track to donate [500 million more](https://www.npr.org/sections/goatsandsoda/2021/08/03/1023822839/biden-is-sending-110-million-vaccines-to-nations-in-need-thats-just-a-first-step) by the end of summer. Other countries are following the administration’s leadership and ramping up their donations. To be sure, the United States and other wealthy nations still need to give considerably more. But the fact remains that ramping up production in bona fide facilities and donating doses are the most straightforward steps to producing the vaccine doses needed to end the pandemic. The effort to strip intellectual property rights, by contrast, would put success against the global scourge of Covid-19 even further out of reach. Michelle McMurry-Heath is a physician-scientist and president and CEO of the Biotechnology Innovation Organization.

#### 4] Squo solves

Crosby et al. 6-8, Daniel Crosby specializes in international trade, investment and matters related to public international law. A partner in our International Trade practice and the manager of our Geneva office, Daniel helps sovereign and business clients to achieve practical economic objectives around the world by applying and negotiating international agreements. JDSUPRA, June 8, 2021. “Update on the Proposed TRIPS Waiver at the WTO: Where is it Headed, and What to Expect?” <https://www.jdsupra.com/legalnews/update-on-the-proposed-trips-waiver-at-8411942/> brett

Proponents have advanced the proposed TRIPS waiver in the name of meeting global vaccine demand. But even in the absence of a waiver, pharmaceutical manufacturers have continued efforts to expand global production and distribution of COVID-19 vaccines and therapies, with a focus on expanding access to developing countries. For example, Pfizer announced its plan to deliver two billion doses to developing nations over the next 18 months, with one billion doses coming this year.8 One forecast estimates that, by the end of 2021, total global COVID-19 vaccine production may exceed 11 billion doses – an amount potentially sufficient to achieve global herd immunity.9 Several pharmaceutical industry groups have also proposed a five-step plan to “urgently advance COVID-19 equity,” including: (1) increasing dose sharing among countries through COVAX and other mechanisms; (2) optimizing production of vaccines and raw materials; (3) eliminating trade barriers for critical raw materials; (4) supporting country readiness to deploy vaccination programs; and (5) driving further innovation.10 Manufacturers have also continued to partner with other companies in efforts to scale up global production. For example, Moderna recently engaged Samsung Biologics to provide fill-and-finish manufacturing for Moderna’s vaccine.11 Merck and Gilead also each entered into or expanded voluntarily licensing programs with manufacturers in India to produce the companies’ respective COVID-19 antiviral agents molnupiravir and remdesivir.12 Some WTO members have also considered using the existing TRIPS flexibilities to expand their vaccine access. For example, Bolivia has continued to pursue its effort to import the Johnson & Johnson COVID-19 vaccine from Canadian company Biolyse Pharma, under a compulsory license pursuant to TRIPS Article 31bis (if one could be obtained).13

#### 5] The waiver is too slow

Rajesh Vellakkat 21, LLM Student, London School of Economics and Political Science and Partner of Fox Mandal and Associates LLP, Advocates and Solicitors, India. SSRN, June 7, 2021. “IP Waiver during COVID Pandemic – Salvage or Apostacy ?” <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3861961> brett

In addition, neither are there news reports of any other critical drug used for Covid 19 treatment or their shortage nor about a patent related hurdle in the manufacture of any drug used for Covid 19 treatment. For argument’s sake, let us assume that many other patented drugs are being used for Covid -19, which is in short supply and there is no such voluntary license given by the patent owner. Then will this patent waiver help? The answer is simple, unlikely for a year or more. It will be impossible to reverse engineer and set the entire manufacturing process so quickly. If the present technology owner is not willing to support, it would not be easy to find a parallel process of creating the drug in a short duration. Procurement of the active ingredients and raw materials is another challenge. Getting the required approvals and thereafter manufacturing a drug is a time-consuming process. To launch a new drug requires certain safety protocols and clinical trials. A waiver of IP rights will not waive regulatory requirements for drug approvals. Hence, even if a new Indian manufacturer attempts to make a drug, it invariably may take minimum of two to three years. By a waiver of patents, no one can compel the existing manufacturer to share the know-how. So, a waiver of patents on drugs relating to Covid-19 may not give any immediate effect in sourcing drugs for managing Covid19.

#### 6] Moderna proves IP isn’t the issue

Osenga 21 Kristen Osenga [Kristen Osenga is the Austin E. Owen Research Scholar and Professor of Law at the University of Richmond School of Law.], 5-28-2021, "The Biden Administration's IP Waiver Is a Huge Mistake," RealClearMarkets, <https://www.realclearmarkets.com/articles/2021/05/28/the_biden_administrations_ip_waiver_is_a_huge_mistake_778895.html> , EH

Proponents of the waiver argue that the prospect of quicker vaccinations outweighs suppressing innovation. In reality, waiving IP protections is a largely symbolic move that is unlikely to speed up either the production or distribution of vaccines. For one thing, Moderna has already voluntarily waived IP protections for its vaccine, which means any company can manufacture the Moderna vaccine. Additionally, international law already allows for compulsory licensing of vaccines. Both of these factors mean that there is little need for additional intervention because if a country wants to manufacture a coronavirus vaccine, it may already do so. Even under the most optimistic timeline imaginable, it would take months to implement this waiver and begin manufacturing vaccines. By the time the change is effective, most countries will likely already have enough vaccines because of companies like Moderna and humanitarian aid from countries like the United States.

#### 7] They have the burden to prove TRIPS is obstructing vaccine production---no evidence exists.

Spadt and Koopman 5-24 Jonathan H. Spadt & Andrew J. Koopman 5-24, Jonathan H. Spadt is the Chief Executive Officer and President of RatnerPrestia. Andrew J. Koopman, J.D., Temple University Beasley School of Law (2008) Vice President, Intellectual Property Law Society Member, Intellectual Property Moot Court team Staff Writer, International and Comparative Law Journal B.S., Engineering Physics, Cornell University (2005) Minor in Electrical Engineering. 5-24-21, RatnerPrestia. “The “Moral” Waiver of IP Protection For COVID Vaccines: Why The US Proposal Creates More Problems Than It Solves” <https://www.ratnerprestia.com/2021/05/24/the-moral-waiver-of-ip-protection-for-covid-vaccines-why-the-us-proposal-creates-more-problems-than-it-solves/> brett

The reservations expressed by European and US leaders reflect a combination of short term practical concerns and long term policy interests. Most relevant to the goal of the waiver is the notion that IP restrictions, rather than export controls or logistical factors, represent the primary barrier to vaccine distribution. At this point, there is little evidence in support of this notion. In the great majority of nations, no patents have yet issued that would interfere with the manufacture of vaccines. Even were there such patents, the TRIPS Agreement already provides for the grant of compulsory licenses in the event of a national emergency. That such a provision has not yet been invoked is itself a blow to the argument that vaccine patents are interfering with vaccine production.

The consensus opinion is that the primary obstacle to vaccine supply across the globe is distribution. The short term problem of vaccine supply would be more directly remedied not by a waiver of IP rights, but by a willingness of nations with a vaccine surplus and manufacturing wherewithal to share their supply. Indeed, the Biden administration recently announced that 20 million doses of currently authorized vaccines would be shipped overseas beginning in June, on top of an earlier pledge of 60 million doses of the AstraZeneca vaccine once authorized. This commitment by the United States to ship 80 million doses overseas, presumably by the end of June, would be a more effective response to pressure from the EU than the Biden administration’s waiver support.

#### 8] No Global capacity to manufacture vaccines

Wallach 21 Lori Wallach [Director, Global Trade Watch, Public Citizen], 6-17-2021, “Web event—Confronting Joe Biden’s proposed TRIPS waiver for COVID-19 vaccines and treatments, AEI (American Enterprise Institute), <https://www.aei.org/wp-content/uploads/2021/06/210617-Confronting-Joe-Bidens-proposed-TRIPS-waiver.pdf?x91208&x91208> // EH

Second, the myth of this vast global capacity to manufacture COVID vaccines that somehow exists out there is unsubstantiated and frankly, in my opinion, untrue. But there is no such thing as vast untapped, idle capacity that could be turned around on a dime to start making COVID vaccines within weeks or even months. This capacity needs to be built; it needs to be established. And at a time when time is of the essence to beat this pandemic, starting capacity-building discussions is helpful, but it won’t be the answer to beat this pandemic. It will be the answer if we do everything right to beating the next pandemic. And if we learn any lesson of this, and then I will stop, is that the COVID waiver as well as the situation in which we find ourselves — if anything, it’s a reminder that we definitely have to take global capacity-building more seriously than we did in the past. That is true for the global North, as well as for middle-income countries — all of whom have to dedicate themselves much more determinedly to pandemic preparedness. And there’s a need to invest both in preparedness and in public health systems that hasn’t happened in the wake of past pandemic threats.

#### 9] No econ impact

#### Downturns don’t cause war – best empirics

Clary 15 – Christopher Clary, PhD in Political Science from MIT, M.A. in National Security Affairs, Postdoctoral Fellow, Watson Institute for International Studies, Brown University, 2015 (“Economic Stress and International Cooperation: Evidence from International Rivalries,” April 25th, Available Online via SSRN Subscription, AIvackovic)

Do economic downturns generate pressure for diversionary conflict?

Or might downturns encourage austerity and economizing behavior in foreign policy? This paper provides new evidence that economic stress is associated with conciliatory policies between strategic rivals. For states that view each other as military threats, the biggest step possible toward bilateral cooperation is to terminate the rivalry by taking political steps to manage the competition. Drawing on data from 109 distinct rival dyads since 19i9 50, 67 of which terminated, the evidence suggests rivalries were approximately twice as likely to terminate during economic downturns than they were during periods of economic normalcy. This is true controlling for all of the main alternative explanations for peaceful relations between foes (democratic status, nuclear weapons possession, capability imbalance, common enemies, and international systemic changes), as well as many other possible confounding variables. This research questions existing theories claiming that economic downturns are associated with diversionary war, and instead argues that in certain circumstances peace may result from economic troubles. I define a rivalry as the perception by national elites of two states that the other state possesses conflicting interests and presents a military threat of sufficient severity that future military conflict is likely. Rivalry termination is the transition from a state of rivalry to one where conflicts of interest are not viewed as being so severe as to provoke interstate conflict and/or where a mutual recognition of the imbalance in military capabilities makes conflict-causing bargaining failures unlikely. In other words, rivalries terminate when the elites assess that the risks of military conflict between rivals has been reduced dramatically. This definition draws on a growing quantitative literature most closely associated with the research programs of William Thompson, J. Joseph Hewitt, and James P. Klein, Gary Goertz, and Paul F. Diehl.1 My definition conforms to that of William Thompson. In work with Karen Rasler, they define rivalries as situations in which “[b]oth actors view each other as a significant political-military threat and, therefore, an enemy.”2 In other work, Thompson writing with Michael Colaresi, explains further: The presumption is that decisionmakers explicitly identify who they think are their foreign enemies. They orient their military preparations and foreign policies toward meeting their threats. They assure their constituents that they will not let their adversaries take advantage. Usually, these activities are done in public. Hence, we should be able to follow the explicit cues in decisionmaker utterances and writings, as well as in the descriptive political histories written about the foreign policies of specific countries.3 Drawing from available records and histories, Thompson and David Dreyer have generated a universe of strategic rivalries from 1494 to 2010 that serves as the basis for this project’s empirical analysis.4 This project measures rivalry termination as occurring on the last year that Thompson and Dreyer record the existence of a rivalry.

Economic crises lead to conciliatory behavior through five primary channels. (1) Economic crises lead to austerity pressures, which in turn incent leaders to search for ways to cut defense expenditures. (2) Economic crises also encourage strategic reassessment, so that leaders can argue to their peers and their publics that defense spending can be arrested without endangering the state. This can lead to threat deflation, where elites attempt to downplay the seriousness of the threat posed by a former rival. (3) If a state faces multiple threats, economic crises provoke elites to consider threat prioritization, a process that is postponed during periods of economic normalcy. (4) Economic crises increase the political and economic benefit from international economic cooperation. Leaders seek foreign aid, enhanced trade, and increased investment from abroad during periods of economic trouble. This search is made easier if tensions are reduced with historic rivals. (5) Finally, during crises, elites are more prone to select leaders who are perceived as capable of resolving economic difficulties, permitting the emergence of leaders who hold heterodox foreign policy views. Collectively, these mechanisms make it much more likely that a leader will prefer conciliatory policies compared to during periods of economic normalcy. This section reviews this causal logic in greater detail, while also providing historical examples that these mechanisms recur in practice.

## C2

#### 1] Infectious diseases don’t cause extinction

Owen Cotton-Barratt 17, et al, PhD in Pure Mathematics, Oxford, Lecturer in Mathematics at Oxford, Research Associate at the Future of Humanity Institute, 2/3/2017, Existential Risk: Diplomacy and Governance, https://www.fhi.ox.ac.uk/wp-content/uploads/Existential-Risks-2017-01-23.pdf

For most of human history, natural pandemics have posed the greatest risk of mass global fatalities.37 However, there are some reasons to believe that natural pandemics are very unlikely to cause human extinction. Analysis of the International Union for Conservation of Nature (IUCN) red list database has shown that of the 833 recorded plant and animal species extinctions known to have occurred since 1500, less than 4% (31 species) were ascribed to infectious disease.38 None of the mammals and amphibians on this list were globally dispersed, and other factors aside from infectious disease also contributed to their extinction. It therefore seems that our own species, which is very numerous, globally dispersed, and capable of a rational response to problems, is very unlikely to be killed off by a natural pandemic. One underlying explanation for this is that highly lethal pathogens can kill their hosts before they have a chance to spread, so there is a selective pressure for pathogens not to be highly lethal. Therefore, pathogens are likely to co-evolve with their hosts rather than kill all possible hosts.39

#### 2] Burnout and geographical isolation check extinction from disease

Consiglio 17 [Dave, Community College Professor of Chemistry and Physics, 12/7/17, “Could a Disease Wipe Out Humans Entirely?”, <https://www.forbes.com/sites/quora/2017/12/07/could-a-disease-wipe-out-humans-entirely/#387c2f308203> Accessed 2/8/28] BBro

What scenarios seem like they should kill everyone but actually won't? Disease. Everyone seems worried about a killer disease, be it HIV or Ebola or Flu or some unknown pathogen. But humans are going to be really hard to wipe out via disease. Why? Well, we have several things going for us: We have a massive population. **We are geographically widespread**. We are capable of eating nearly anything. We are reasonably diverse as a species. **There are geographically** and genetically **isolated** pockets of our **population. Diseases require** a **vector** to spread. Let’s say the perfect disease arose tomorrow: It kills two weeks after you get it, shows no symptoms until the last minute, is really easy to transmit, and we have very little immunity to it. It still doesn’t kill everyone. Native Greenlanders and the people in Antarctica and people on Navy submarines and the few random people who are immune, and park rangers all either never come into contact with an infected person or else are spared by a genetic fluke. We even have the International Space Station as a potential place to hide and wait for the epidemic to die down. In fairness, nearly everyone is dead in short order, but **once** the **disease has run its course, the pathogen** that causes it **is also** likely to be **dead.** The vast majority of pathogens don’t survive for long outside of their hosts. As such, once nearly everyone is dead and the survivors wait a bit, they’re **unlikely to encounter live pathogen**. As an added bonus, the few surviving people include many of the most naturally immune members of the (now mostly dead) population. Now, don’t get me wrong, this scenario would be catastrophic for humanity. 99.9% of us could die in this way. And it’s possible that the remaining humans would be so isolated as to be unable to find one another for the purposes of reproduction. But I doubt it. Humans are nothing if not fecund, and we have those submarines, boats, airplanes, etc. We will eventually come out from hiding, find that special someone, and breed our way out of trouble. It’s why we’re still around as a species - nothing stops us from making more humans.