# LD Aff

* **I affirm the resolution today, stating that the appropriation of Space by private entities is unjust.**
* **The Value of the Preservation of Utilitarianism ought to be the driving force behind an affirmative ballot in today’s debate. We ought to be valuing how we can save or benefit the most amount of human life throughout the round and the best way to do that is to have the recognition that privatization and appropriation of space will only hurt the population. Utilitarianism is key because it provides a key bridge to help the MOST amount of people at any given point. Without it, we risk extinction and other ailments on multiple fronts.**
* **The criterion behind the debate is the bolstering of International Space Law. This is a type of Phenomenology; laws that we can physically observe and see justification of. Don’t let the neg present a ton of arguments that have zero material impacts. Therefore Util only is the best way to frame the debate and moreover why the aff should win.**
* **Let’s get into a few definitions:**

**“Appropriation” Cambridge 21** https://dictionary.cambridge.org/us/dictionary/english/appropriation The act of taking something **for your own use, usually without permission.**

**“Private Entities” Cornell Law 21** https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def \_id=6-USC-625312480- 168358316&term\_occur=999&term\_src=title:6:chapter:6:subchapter:I:section:1501 (A) In general Except as otherwise provided in this paragraph, **the term “private entity” means any person or private group, organization, proprietorship, partnership, trust, cooperative, corporation, or other commercial or nonprofit entity, including an officer, employee, or agent thereof**. (B) Note cooperative – Public / private partnerships are considered appropriation under this definition.

# International Law

#### The aff has global signaling effects that bolster international law

Hughes 20 [(Justin, Hon. William Matthew Byrne, Jr. Chair, Professor of Law at Loyola Marymount University, worked in the Obama Administration as Senior Advisor to the Undersecretary of Commerce for Intellectual Property) “The Charming Betsy Canon, American Legal Doctrine, and the Global Rule of Law,” Vanderbilt Journal of Transnational Law, 10/2020] JL

Turning to domestic rule of law in other countries—and those countries implementing in their domestic laws the treaty obligations they have undertaken, pacta sunt servanda, it should be clear that the Charming Betsy doctrine provides an example for other countries. Each American court decision interpreting an ambiguous statute to fulfill our treaty obligations sends a signal to judges in other jurisdictions to do the same. One can debate how strong a signal and how much American courts can lead by example, but there is no question that the American legal system—judicial decisions,124 regulations,125 and statutes126—provides an important role model for other countries.

Strengthening this global rule of law serves both the United States’ ideals and its pragmatic needs. Idealistically, in the post-1945 world the thicket of international legal norms has grown more vast and dense—and that thicket of norms has been largely shaped by the United States.127 The great international project of the United States—the Pax Americana—has not just been relative peace, but the spread of democratic institutions and human rights as well as the increasing economic prosperity of the world based on increasingly transparent, predictable market conditions. It may be diplomatically awkward to discuss, but it is simply hard to overstate how much the post-1945 international human rights, trade, and finance regimes have been built along American outlines.128 The rule of law’s strengthening in as many jurisdictions as possible undergirds these projects.

On the practical side, nothing is more important for the efficient, affordable maintenance of America’s far-flung geopolitical and commercial interests than rule of law in as many of those jurisdictions as possible. In 2007, Eric Posner and Cass Sunstein argued that Charming Betsy should give way to Chevron-style deference to executive interpretations of statutes that concern foreign affairs129— an argument that we will explore in Part V. While recognizing that Charming Betsy produces the benefit of “a general strengthening of the system of international law,”130 they reasoned that this should only trigger “an additional judgment about whether deference has systemic or rule of law benefits or disadvantages for the United States.”131 In the context of that calculus, Posner and Sunstein offered the stunning comment (then and now) that “[t]he United States generally has little interest in what occurs on foreign soil.”132 From that, they reasoned that calculated violations of international law will often enough accrue to the short-term benefit of the United States without long-term detriment that such decision should be left to the executive branch.133

The claim that “[t]he United States generally has little interest in what occurs on foreign soil” was and is fake news from law professors.134 The reality of the early twenty-first century is that 3 to 6 million American citizens live abroad and—as noted by Justice Breyer— on average, 23 million Americans travel abroad each year.135 The reality is that the United States has over $4 trillion in accumulated investment on foreign soil (making it, as of 2012, the world’s largest investor in other jurisdictions).136 In short, the safety of a vast amount of American blood and treasure depends on “what occurs on foreign soil.” Those lives and wealth are more secure when these other jurisdictions adhere to mutually-agreed international legal norms, whether on maritime navigation or civil litigation, freedom of religion or protection of trademarks.

As to customary international legal norms protecting individuals, a reason for us to respect those norms domestically is that “our State Department has often successfully insisted foreign nations must recognize [those norms] as to our nationals abroad.”137 On the treaty side, we have spent enormous diplomatic efforts for two centuries pursuing series after “series of treaties” seeking “in general to put the citizens of the United States and citizens of other treaty countries on a par with regard to trading, commerce and property rights.”138 What we secure in those treaties is worthless unless rule of law in other jurisdictions implements each country’s international obligations in its domestic legal order. Indeed, even if no American ever set foot abroad, for transborder problems—from carbon emissions to human migration to protection of endangered species—domestic enforcement in other jurisdictions of agreed international rules is very much in our practical, local interests.

At the end of the day, a global rule of law explanation of Charming Betsy can either be the normative undertaking of a single judge or reflect the normative undertaking of the United States to produce a more law-abiding global community; either way, the use of the Charming Betsy canon in American jurisprudence sends a message of commitment to rule of law. That should be congressional intent, but even if it were not, it should be our national intent as the globe’s “leading proponent of international human rights law,”139 leading proponent of rules-based free markets, leading proponent of democratic institutions, etc. Understanding the Charming Betsy canon as a manifestation of global rule of law, the discussion below considers different problems for the canon in contemporary circumstances.

#### That’s key to ILaw globally—other nations’ buy-in is based on perceived US credibility and without international law on Space Exploration we lose that

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In some cases, the United States has become a party to a treaty regime and then failed to support it adequately with the funding or commitment that would help ensure effectiveness. This problem surfaced with the CWC following a bitter ratification tussle. After the Senate imposed twenty-eight "conditions," notwithstanding the CWC's express prohibition of any reservations, the chamber gave its consent on April 24, 1997. But after the treaty's entry into force, America met CWC implementation requirements with intransigence. United States personnel - under Pentagon oversight - were especially uncooperative with inspectors, frustrating verification of chemical stockpiles. Underscoring the extraordinary influence that the United States exerts, nations around the world followed its lead, for better and for worse. Once the U.S. Senate ratified the CWC, news spread quickly and eighty-six countries joined on the same day. Other states also took note of the twenty-eight "conditions," particularly the one forbidding CWC officials from removing samples of material from U.S. territory for tests - a central piece of the rigorous inspection system. India inserted the same provision into its ratification, while other states parties, including China and Japan, intimated they would take advantage of like conditions. When the United States submitted its declaration on chemical weapons production facilities late, others emulated it. Nations likewise failed to pay their dues in a timely fashion, just as the United States was tardy with its payments. This mimetic effect even reached American actions on the ground, as China and Iran similarly objected to the use of x-ray verification by inspectors. Over time, however, the United States grew familiar with CWC procedures and reached a level of accommodation. If America can now justly claim to be an upstanding member of the treaty regime, its recent dispute over use of riot control agents and calmatives has rekindled tensions.29

#### Strong international law solves a laundry list of existential threats including disease. Without it we essentially face guaranteed extinction.

Shaffer 12 [Gregory, Melvin C. Steen Professor of Law, and Affiliated Professor in the Department of Political Science, University of Minnesota, “International Law and Global Public Goods in a Legal Pluralist World,” Eur J Int Law (2012) 23 (3): 669-693, <http://ejil.oxfordjournals.org/content/23/3/669.full>] // Lex AKu

We face imminent financial collapse with scant collective will to address it. Power fragments and states holding nuclear weapons destabilize, risking nuclear proliferation and eventual terrorist use. Climate change intensifies while states that are the main contributors dither and politicians with veto power trivialize repeated scientific findings as ‘the greatest hoax ever perpetrated’.1 Fisheries deplete, deserts expand, and aquifers diminish. International law scholarship, in the meantime, takes a turn towards celebrating pluralism without sufficiently accounting for institutional variation to address different contexts. Those writing on global public goods challenges, at the same time, tend to come from disciplines other than law.2 Increased transnational interdependence recasts domestic issues into global ones. To give one mundane example, until 1997, corporate insolvency law in Indonesia was considered a purely local matter. But with the onset of the Asian financial crisis, the World Bank, International Monetary Fund, and Asian Development Bank rethought domestic corporate insolvency law as a global issue in light of the risks of financial contagion, threatening a global public good, financial stability.3 Other examples include domestic banking regulation, tax avoidance (given the impact on state sovereign debt crises), pest control, public health, and civil conflict. In response, states create new international institutions and existing international institutions expand their mandates. The UN Security Council has expanded its mandate for overseeing international peace and security to authorize ‘humanitarian intervention’, and the World Health Organization has done so to address public health in response to the SARS epidemic and similar threats.4 States and state institutions sometimes create international club-like institutions with limited membership, such as the Financial Action Task Force and the Basel Committee on Banking Supervision, with the express aim of affecting behaviour in non-members, such as over money laundering and bank capital requirements.5 So what is international law’s role in the production of global public goods? Where are greater international legal constraints and international institutions needed, and where should international law retain slack? International law both is required to produce global public goods and can potentially impede dynamic processes that are needed to address global public goods challenges. This article provides a framework for addressing these issues in light of variation in the properties of global public goods (section 3), their distributive implications (section 4), and alternative institutional choices for confronting them, as reflected in different theoretical visions for global governance advanced within international law scholarship (section 5). But first we address the rise of the legal pluralist vision (section 1) and the tensions between it and the concept of global public goods (section 2). 1 The Rise of the Legal Pluralist Vision Legal pluralism seems a bit of a fad in international law scholarship today, just as dialectical federalism may be a bit of a fad in the United States, and constitutional pluralism in the European Union.6 Legal pluralism is a construct, a way of understanding and envisaging the world, both positively (the way the world is) and normatively (the way it should be). The challenge with the legal pluralist construct is how it takes account of the global public goods challenges confronting us. What has led to the rise of this academic construct, its proliferation, its catching on, its enticement of our imaginations? In part, the concept resonates with our experience of multiple overlapping orders in tension with each other, with no clear centre. In part, the concept provides a normative vision of restructuring plural orders into pluralist ones – that is, re-envisaging them from fragmented, closed, sovereign legal orders into an open, interacting, interlinked, interdependent, multi-level structure of legal ordering. In part, it particularly resonates with those writing in Europe, reflecting the European experience with supranational law. The European experience, encompassing both economic regulation and human rights protection, is viewed as an experimental model and ‘laboratory’ for the ordering of a global legal pluralism, one which provides order without centralized hierarchy, hegemony, or the abandonment of public law principles to transnational market forces.7 Yet the turn to a pluralist vision also has something to do with our disenchantments, our disenchantment with international law, the limits of the European experiment where a constitutional order exists but has been formally rejected by its citizens, and the failure of progressive politics in the US at the national level, spurring a strategic retreat out of political necessity to bottom up progressive initiatives from small municipal activist havens like Berkeley, California, and Madison, Wisconsin. There are good reasons for such disenchantment within the US, with the populist lure of the Tea Party’s destructive rhetoric of any sense of collective purpose, its members cheering at Republican debates at the prospect of Americans dying because they do not have health insurance. There are good reasons for this disenchantment in Europe with little sense of solidarity in facing a crisis threatening the Euro, the Union itself, and the world, with the biggest sovereign defaults in history, ones that would dwarf earlier defaults in South America and Asia. It is a crisis which – to play with Hobbes’ famous phrase – could be nasty and brutish, but not short. And there are good reasons for such disenchantment globally, with the cynicism of the Bush administration’s despising of international law in invading Iraq, its trivializing of torture, and its ordering the freeze of individual assets through Security Council resolutions with no concern for due process. International law failed to constrain power when power chose to belittle and ignore it, and it served to legitimize power when power deigned to deploy it. The concept of pluralism certainly captures much going on in the world better than its occasional foil, the concept of constitutionalism.8 There is rarely any central hierarchy in international law. And even where there is a glimpse of a shadow of hierarchy, such as decisions by the UN Security Council or of the WTO Appellate Body, there always follows the challenge of implementation. International law depends on national systems and private actors to implement its dictates, and it has little authority to ensure that they do so. We have a fragmented plurality of legal orders spatially in at least three senses.9 First, as international functional organizations proliferate, we have a plurality at the international level – constituting a horizontal plurality. Different semi-autonomous international institutions address common issue areas in different ways. At times actors may strategically create overlap among international institutions to reorient international legal norms when they are unable to trigger such change within an existing institution. The tensions between the rules of the WTO and the Convention on Biodiversity and its Biosafety Protocol are a salient example.10 Institutions with overlapping mandates may also compete for leadership on a legal issue, as the World Bank, International Monetary Fund, and Asian Development Bank did during the Asian financial crisis.11 Secondly, we have a plurality of legal orders between levels of governance – constituting a vertical plurality. Since considerable power remains at the nation state level, whether for producing detailed law, implementing it, or enforcing it, international law must interact with national law to be effective. In practice, domestic law and institutions will always remain critical parts of a recursive process of resistance, adoption, and adaptation of international legal norms, which in turn can reshape those international norms. Thirdly, in an economically interdependent world, private actors develop non-public legal orders at the state and international levels. They are sometimes encouraged by public actors that may later codify these private legal norms, or enforce them judicially, or collaborate through forming ‘public–private partnerships’. We thus also have a plurality of public and private legal orders.12 The concept of legal pluralism does not signify disorder – per the international relations trope of anarchy. Legal pluralism, with its account of interacting legal orders, takes the idea of international law seriously. Otherwise, there is nothing with which national legal systems can interact, except with each other or with private legal ordering. The normative vision of legal pluralism rather aims to foster transnational and global legal order out of the plural; it aims to structure out of the many one, but with the one constituted by the interactions of the many.13 2 Legal Pluralism and the Challenge of Global Public Goods Despite the appeal of the legal pluralist vision, one realizes in reading thought-provoking authors on legal pluralism, such as Mireille Delmas-Marty and Nico Krisch, that though they compellingly support their arguments with examples and case studies, their case studies do not focus on the challenges of global public goods. They do not, one might conjecture, because there is a tension between the operation of legal pluralism and the production of global public goods where processes of pluralist interaction will provide too little too late. What do we mean by a global public good? In economic theory, a public good, in contrast to a private good, is one that is non-excludable (no one can be excluded from the good’s consumption) and non-rivalrous (the good’s consumption does not reduce its availability to others).14 Clean air, for example, is a public good because it is not depleted by our breathing it, and it cannot be appropriated by a few. The term ‘good’ refers to a product, and not a normative attribute. A public good thus can be positive (such as knowledge), or negative, a good that we wish to curtail so that our aim is to produce its absence (such as terrorism). Those promoting international cooperation often broaden the definition of a public good classically used in economic theory, which was statist in its initial focus, to encompass a larger number of issues for global action. On the one hand, the two-fold ‘publicness’ of a good in practice often lies along a continuum, so that goods may combine public and private attributes, complicating the assessment of how to generate them.15 On the other hand, one reason policy-makers arguably have developed a broader definition of global public goods is to enhance the scope for global governance projects and thus legitimize their pursuit.16 The concept of global public goods, for example, was originated under a project sponsored by the UN Development Programme which seeks funding for projects. Inge Kaul and her collaborators, leading that project, use a relaxed definition of public good as ‘goods with benefits that extend to all countries, people, and generations’,17 while noting that the concept of public good is a social construction.18 Such expanded definitions, however, risk making the concept of global public goods so malleable that it becomes abused, leading to scepticism and cynicism regarding its relevance.19 As we will see in section 3, we rather need to differentiate among different types of public goods in order meaningfully to address the role of international law and organizations in their production. The major challenge for the production of many (but not all) global public goods, as well as those public goods that are transnational (but not global) in scope,20 and thus the challenge of celebrating legal pluralism, is collective action and free riding. Nation states and other actors will not invest in global public goods if their independent action will have no impact, or if they can free ride on the investment of others. To produce global public goods often requires a sense of collective purpose based on mutual interests and understandings. To arrive at that collective purpose, we need (for economists) an alignment of incentives, and (for sociologists) socialization processes that lead to a common identity (such as national citizens). We are then more likely to cooperate and create institutions that invest in producing public goods. The creation of nation states with general taxing powers and a monopoly of the legitimate use of force facilitated the production of national public goods. The development of the theory of public goods correspondingly has been statist on account of the existence of centralized decision-making in nation states which produce them.21 The most salient challenge internationally is that we lack legitimate, centralized institutions with general taxing and regulatory powers. We thus have traditionally depended on cooperation between nation states involving decentralized forms of implementation and enforcement to advance collective goals. International law facilitates this cooperation through creating international institutions and common norms and rules, thereby reducing transaction, monitoring, and enforcement costs and building shared understandings.22 States created the UN and its Security Council to help to ensure the global public good of international peace and security. They created the World Health Organization to protect public health from the spread of infectious diseases, the UN Framework Convention on Climate Change to address climate stabilization, the World Trade Organization to address trade liberalization and help to manage inter-state trade conflicts so that they do not escalate into 1930s beggar-thy-neighbour policies, the Financial Action Task Force to address money laundering of illicit funds, and the International Monetary Fund to stabilize currency and sovereign debt crises. The concerns addressed by these institutions can be viewed in global public goods terms. Yet none of these institutions has a general taxing power to address them. All of them depend on negotiations between states over the amount of ‘contributions’. 3 The Need to Differentiate between Global Public Goods In order to assess the place and role of international law and institutions to promote and govern the production of global public goods, we need to differentiate among the range of public goods challenges faced, as opposed to speaking of global public goods and international law in the abstract. Global public goods come in different varieties, calling for different institutional responses, sometimes involving greater centralization through international law and institutions, and sometimes not. There is no one size fits all, no one optimal institutional structure. For the production of many global public goods, legal pluralism, in which different legal orders interact with each other, works fine. There may be little need for international law, at least in its hard (mandatory) law variety, much less centralized international institutions. Since global public goods do not come in one variety, international law plays a variable role in their production. As Scott Barrett conceptualizes in his book Why Cooperate?: The Incentive to Supply Global Public Goods,23 some global public goods raise collective action problems and others do not. Barrett, following other economists, classifies global public goods into three varieties: single best efforts goods, weakest links goods, and aggregate efforts goods.24 An example of a single best efforts public good, on the cover of his book, is the crashing of a giant asteroid into the earth. All countries are affected by this prospect. Scientists do not know when one will hit and what size it will be, but they find that small ones hit the earth about once a month, and estimate that potentially catastrophic ones that could devastate an area the size of Manhattan every 250 years, and one that could cause the extinction of most life forms every 65 million years.25 For this global public good, the US has the incentive to finance research and implement technology to detect and deter such happenings. No international treaty is required for it to do so. Other countries may free ride on the US’s research, or may engage in complementary research, but that will not deter the US from investing. Similarly, countries, companies, and even individual researchers have incentives to invest in basic science on their own which can benefit the world. Joseph Salk’s development of the polio vaccine in the US was a gift to the world, as he did not patent the polio vaccine.26 Such a good can be produced by private initiatives (such as those of pharmaceutical companies and of the Gates Foundation), purely national ones (such as those of the National Institutes of Health), or international collaborative ones (such as the UNICEF/UNDP/World Bank/WHO Special Programme in Tropical Diseases).27 Is there no required role for international law in these cases? Even in the asteroid case, Barrett notes the potential negative externalities of other countries relying on the US. The US may have the incentive to invest in producing the global public good, but in a way that could create a new risk. If an asteroid bears toward the earth, and if the existing technology is such that the asteroid could only be slightly deflected so that it would crash into a different part of the earth, who should make the decision regarding its deflection? Even if it were to be deflected into the ocean, the location of its impact would raise differential risks for countries of a tsunami.28 Similarly, geoengineering increasingly looks like an important policy option for climate stabilization, given the world’s inability to reduce carbon emissions. It thus can be viewed as a global public good, at least to avoid abrupt and catastrophic climate change.29 Since engineering the climate may be relatively cheap, it could be a single best efforts global public good. Yet like climate change itself, geoengineering may benefit some countries and harm others. Climate engineering constitutes a huge experiment that poses unforeseeable, differential risks for countries in light of uncertainties. A wealthy country may decide to invest in geoengineering to assist its own climate situation, but in the process have negative externalities on others. If different countries engage in climate engineering, their plural efforts will interact, potentially undercutting each other. Coordination over climate change thus raises governance challenges. Who should decide whether and how the climate should be engineered? Once again, there is a role for international law and international institutions in coordinating decisions even though only one or a few wealthy countries invest in geoengineering on their own. Eliminating infectious diseases and curtailing the proliferation of weapons of mass destruction are weakest link public goods. A wealthy country can invest in preventing an infectious disease within its borders through financing the vaccination of its population each year. The US does so, for example, with polio vaccines. Yet it would be much more cost effective to eradicate polio, as the world did for smallpox in the 1970s. The benefit-cost ratio for smallpox eradication is thought to be 159:1, if all costs are included, and 483:1, if only international funds for financing eradication efforts in developing countries are considered.30 That is a remarkable rate of return. Investing in polio eradication could provide another global public good. Yet, in order to eradicate polio, poor and failed states, such as Somalia, are the weakest links. The World Health Organization, an international institution created under the auspices of the UN and inheriting the mandate of an earlier institution created pursuant to the League of Nations, leads the eradication efforts. The WHO includes distinct voting rules for its regulations on infectious diseases, which facilitate collective action for collective purposes. The general rule of international law of treaties is an ‘opt in’ rule. A state is not bound unless it consents. Under Articles 21 and 22 of the WHO constitution, however, a majority decision is binding on matters involving ‘procedures designed to prevent the international spread of disease’, unless a state opts out. The WHO created new International Health Regulations in 2005 pursuant to these provisions, which require states to build institutional capacity toward containing communicable diseases, collaborate with each other, and maintain clear points of contact.31 In parallel, the regulations expand the legal authority of the WHO’s Director-General to intervene in response to communicable disease outbreaks, including through a system for convening experts and declaring a public health emergency of international concern. As has been shown experimentally and statistically, opt-out rules generate much broader participation than do opt-in rules.32 No WHO member, in fact, opted out of the 2005 International Health Regulations.33 Keeping weapons of mass destruction out of terrorist hands is another weakest link global public good. We do not know where or when such weapons will be used, but the fallout of their use will have global repercussions, whether for life and health, civil rights, or the global economy. Countries thus have the incentive to keep these weapons out of terrorist hands, but the result will depend on the weakest links. The weakest links today are Pakistan, Russia, and North Korea. New weakest links may emerge, as more states invest in nuclear technology to gain advantage or parity with their rivals. States in 1968 signed the Nuclear Non-Proliferation Treaty (NPT), which was extended indefinitely in 1995,34 and the Convention on the Physical Protection of Nuclear Material in 1987, amended in 2005.35 In addition, the UN Security Council passed Resolution 1540 in 2004 which enjoins all states to take measures to prevent nuclear weapons materials from being obtained by non-state actors having ‘terrorist purposes’.36 The non-proliferation regime, however, has been under some risk of unravelling, as the Bush administration created a special regime for India and reconsidered the US’s first strike options and weapons development plans.37 The severest global public goods challenge today is what Barrett calls an aggregate efforts public good – that is, where the global public good can only be produced through the aggregate efforts of multiple countries. The world appears to have been startlingly successful in addressing the depletion of the ozone layer, starting with a framework convention, then turning to hard law obligations that were progressively enhanced, and then using soft law mechanisms to facilitate compliance, even when formally hard law sanctions were available.38 The Montreal Protocol on Substances that Deplete the Ozone Layer created a variety of sticks and carrots to realign incent ives, including potential trade sanctions and a Multilateral Fund for Implementation for developing countries. In contrast, the world has been completely unsuccessful in addressing climate change mitigation, which is a much more complex and difficult issue that is more susceptible to free riding, undermining collective action. Human-induced climate change is happening and it is not clear what, if anything, effectively will be done to reduce emissions. These different public goods entail different problem types. That of weakest link public goods involves a holdout problem, whether the holdout is an unwilling one, such as North Korea over nuclear weapons, or an unable one, such as Somalia regarding polio eradication. That of aggregate efforts public goods involves a free rider/collective action problem, resulting in underinvestment in providing a solution. And that of best shot public goods involves a positive externalities problem because the investor does not fully capture the benefits. It is easier to fund best shot public goods, even if the result is overinvestment from the perspective of global efficiency. A technological alternative to chlorofluorocarbons (CFCs) for refrigerants, propellants, and solvents (a best shot problem) appears to have resolved ozone layer depletion by facilitating the phase-out of CFCs (an aggregate efforts problem). Similarly, climate engineering (a best shot problem) has become a default solution for addressing climate change because of the difficulty of agreeing to emissions reductions (an aggregate efforts problem). There is a varying role for international law and international institutions in producing these different global public goods. For best shot global public goods, an international institution is not needed to develop them. Private foundations could provide some of these goods, such as through prizes for the development of new drugs to combat tropical diseases. Yet where decisions over implementation can have negative externalities, international legal obligations and institutions that constrain unilateral action can better ensure fairness and manage conflicts, and possibly produce public goods more efficiently, as in the case of asteroid deflection and climate engineering. For aggregate efforts public goods, in comparison, there is a greater need for centralized institutions to produce them, leading to a relinquishment of some national sovereignty. The opening quotation from Nordhaus reflects his frustration with the global collective failure to address climate change. In contrast, with weakest link public goods, the challenge sometimes lies in building state sovereignty. The challenge for disease eradication, for example, is with ‘failed states’ that lack functional governing institutions. In other weakest-link situations involving states unwilling to cooperate, such as that of nuclear proliferation, there is greater need for an international institution such as the UN Security Council, combined with financial transfers to secure nuclear materials. Otherwise, pressure for unilateral action will increase. In sum, international law and organizations play varying roles in the production and governance of global public goods. Table 1 summarizes the relationship of different types of global public goods with international law and organizations in a legal pluralist world. 4 The Challenge of Distributive Conflict and the Production of Global Public Goods International law, like all law, has distributive consequences, posing particular challenges for governing the production of global public goods. These distributive issues cannot be elided, although they often are in legal scholarship. At least three distributive issues arise in decisions over the provision of global public goods: the specific terms of cooperation for producing a global public good; choices among producing different global public goods in a world of limited resources; and the potential of actual conflict in the pursuit of different public goods which can act at cross-purposes to each other. It is striking that many of the international legal scholars who incorporate ra tional international relations theory to explain international cooperation have drawn on the familiar Prisoner’s Dilemma (PD) situation from game theory.40 The Prisoner’s Dilemma game, however, elides distributive issues. In the classic PD model, states are assumed to have a defined set of preferences and a common interest in reaching a cooperative outcome, and the primary impediment to be overcome is the fear that other states will cheat on their agreements. In PD models, mechanisms for the monitoring of state behaviour and the sanctioning of states that violate the terms of the agreement can be created to address these concerns. International law thus comes to the rescue to facilitate mutually beneficial outcomes. Since concerns over cheating, shirking, and slacking inhibit the production of global public goods through international cooperation, the PD model may seem appropriate. However, the Prisoner’s Dilemma game ignores another important obstacle to successful cooperation, namely conflicts among states with different interests over the distribution of the costs and benefits of cooperation.41 When states cooperate in international politics, they do not simply choose between ‘cooperation’ and ‘defection’, the binary choices available in PD games. They rather choose among specific terms of cooperation, which raise distributive issues.42 Different states and constituencies within them can have competing preferences for different international rules and standards. States, and especially powerful states, thus jockey to employ different forms of international law in a world of fragmented institutions in an effort to influence the development, meaning, and impact of international law.43 Secondly, different states and private actors benefit from the production of some global public goods more than others. Since resources are limited, they face opportunity costs when they make choices regarding the production of public goods. They must determine not only which public goods to fund, but also how much to fund each of them.44 Distributive concerns arise in choice and budgeting decisions, given states’ and private actors’ conflicting views. Thirdly, the pursuit of different public goods can conflict in a more direct sense. One public good may interfere with the pursuit of another. For example, choices over the generation of at least four public goods arise in the debate over the interaction of public health, pharmaceutical patent protection, human rights, and trade policy: knowledge-generation, liberalized trade, public health, and the right to life and human dignity.45 Knowledge has public-good attributes since once knowledge enters the public domain it is no longer excludable and our consumption does not diminish its availability.46 The central issue is how to generate knowledge that facilitates new inventions and understandings most effectively and equitably. International trade law similarly has public good attributes, since all countries benefit not only from the wider variety of products made available at lower prices that trade liberalization facilitates, but also because they benefit from rules constraining mutually harmful beggar-thy-neighbour policies.47 Public health constitutes a third implicated public good since we all benefit from the global eradication of diseases and we do not diminish that good when we benefit from it.48 The right to life and human dignity can be viewed as yet another affected public good to the extent that it affects our moral sensibilities.49 The production of these public goods, however, can conflict, complicating global decision-making over the terms of international law. The recognition and enforcement of patent rights under the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs Agreement) and other conventions can generate incentives for the production of knowledge and new drugs for the protection of human life. But the protection of pharmaceutical patent rights also can diminish the benefits of liberalized trade by reducing the consumption possibilities of citizens, interfere with the provision of public health policies in containing diseases, and raise human rights concerns, as the AIDS epidemic illustrates. Moreover, mandatory vaccination policies to protect public health raise human rights concerns, especially from a libertarian perspective, and in particular given uncertainty regarding the consequences of vaccinations. In sum, choices over global governance policies involve different values, priorities, and perspectives, considerable uncertainty, and rival public goods. As a result, although the definition of a single global public good is one that is non-rivalrous, global public goods are collectively rivalrous because choices must be made among them, including in funding their production. Decisions over producing global public goods thus raise the question of alternative institutional choices in light of trade-offs. 5 Alternative Institutional Choices for the Production of Global Public Goods: Global Constitutional, Administrative Law, and Legal Pluralist Approaches For the efficient production of pure private goods we rely on (imperfect) preference revelation through the market. For the efficient production of pure public goods we rely on (imperfect) preference revelation through democratic voting. The conventional (although not sole) solution is thus to rely on the state for the production of public goods.50 State decisions, in turn, are constrained by constitutionally provided checks and balances involving different state institutions, including democratically elected legislatures and courts which exercise judicial review of legislative and executive decisions. For the production of global public goods, the institutional analogues are international organizations. Since centralizing decision-making within them raises serious legitimacy concerns, institutional choice poses the ultimate question for the production of global public goods. Although economists and law and economic scholars tend to address the production of global public goods in terms of substantive effectiveness, and thus start with an assumption of what is to be measured, we first need agreement over the goal. Priorities and goals are determined through institutional processes. Where choices among institutions affect opportunities to participate, institutional analysis is needed to focus on the relative biases of participation in alternative decision-making processes that may define priorities and goals. Problems of biased participation beset all institutional alternatives on account of informational and resource asymmetries and divergent incentives to participate because of varying per capita stakes in outcomes. A major challenge in relying on national institutions is that they make decisions which affect outsiders who are not represented before them. In the case of many global public goods, moreover, reliance on national decision-making raises collective action problems and free rider concerns which undercut each nation’s ability to attain its goals. International institutions can help to overcome collective action problems, as well as to reduce bias in participation in national decision-making. However, the major challenge with international institutions is their remoteness from affected constituencies and local contexts, raising legitimacy concerns when decision-making has distributive implications. A key issue from a public policy perspective is thus the assessment of the relative merits of institutional processes, and different combinations of them, in terms of the relatively unbiased participation of affected parties compared with other (non-idealized) institutional alternatives.51 That is, who decides regarding the production of global public goods? Or, put differently, which institutional process, among alternative political, market, and judicial processes at the national, local, regional, and international levels, should be granted how much authority to decide on the appropriate balancing of different goals in light of their distributive implications? These institutional choices affect how different interests, directly and indirectly, are taken into account. Such an approach is decidedly pragmatist. It recognizes that there is no single best approach to producing global public goods, but rather alternative approaches that involve trade-offs which vary in light of particular global public goods problems, and from which we can learn through practice. In current international law scholarship, three analytic frameworks compete for addressing the challenges of global governance, and thus implicitly of the production of global public goods: constitutionalism, global administrative law, and legal pluralism. These frameworks are sometimes put forward as alternatives that better address global governance challenges; yet, for our purposes, they are better viewed as complements that apply differentially to the types of global public goods we have discussed. These frameworks each have attributes and deficiencies that make them more suitable frameworks for some issues compared to others. A The Global Constitutional Approach Global constitutionalism is one of legal pluralism’s chief rivals as a contemporary vision for organizing, constraining, and legitimizing international law.52 The constitutional vision of international law comes in different varieties, but, relative to the pluralist vision, one of its major attributes is its framing international law and international institutions in constitutional terms that involves centralized international institutions,53 often involving some form of majoritarian or supra-majoritarian decision-making. The global constitutional vision is suitable, in particular, for addressing the production of aggregate efforts global public goods. Centralized institutions operating under international law help to align national incentives and to overcome free rider problems facing the production of aggregate efforts global public goods. For example, if climate change stabilization is to occur, centralized rules and institutions to oversee their application will be required, as occurred successfully in the case of the protection of the ozone layer. Under the Montreal Protocol on Substances that Deplete the Ozone Layer, amendments to emissions limits can be made by a two-thirds vote of the parties representing at least half of the total consumption of the parties of controlled ozone-depleting substances, if there is no consensus.54 Analogous voting arrangements will need to be developed for the international regulation of climate change mitigation that take account of those most implicated. For global public goods challenges that pose imminent threats, existing UN institutions, and in particular the UN Security Council, will need to be reformed and updated. The issue of UN reform was considered in the 1990s and 2000s, but remains needed to reflect today’s global context.55 Issues such as asteroid collisions and climate change could even be considered within a reformed Security Council where they pose international security risks. Centralized institutions and regulations have become important for coordinating the monitoring of dangerous diseases and declaring international public health emergencies, as we saw under the WHO’s 2005 International Health Regulation. Finally, as we have seen, even the production of best shot global public goods raises distributive concerns that centralized governance can help to address. Centralized institutions, operating under a constitutional frame of checks and balances, can help to keep national decision-makers accountable. We have seen these issues raised in decision-making over geo-engineering and asteroid deflection for national defence. As globalization and technological advance increase the need for centralized international decision-making, a constitutional frame will become of growing importance for critically scrutinizing and checking these institutions’ exercise of power. Nonetheless, although the global constitutional vision has certain attributes regarding the governance of centralized institutions needed to provide global public goods, these institutions face major legitimacy challenges. The production by national institutions of public goods is beset by trade-offs, ranging from bureaucratic inefficiencies to political corruption. A vastly greater challenge at the global level is the lack of democratic processes that reveal preferences, reflecting the lack of a global demos.56 To the extent that we rely on states to represent citizens’ interests, moreover, many states are not democratic.57 States vary considerably in terms of population, so that decision-making arguably should take into account differences in the size of states (as opposed to generally relying on consensus voting at the international level). Since international institutions are so distant from citizens that it is difficult to conceive of democratic global institutions, we will need to re-conceive or otherwise adapt our concept of democratic checks and balances to the international level,58 and rely on other forms of accountability mechanisms. Curiously, the existing literature on global constitutionalism has been largely silent on the issue of global public goods.59 B The Global Legal Pluralist Approach Although the concept of global public goods poses challenges for the legal pluralist vision and its focus on decentralized processes, this approach remains extremely relevant. Among legal pluralism’s virtues is that pluralism accounts better for divergences in community values, priorities, and perspectives in light of the distributive consequences at stake in the production of global public goods. Enumerating and deliberating over these distributive issues highlights the need for pluralism to contest centralized policies. The legal pluralist vision calls to the forefront the importance of ongoing interaction with state institutions in order for global-public-goods governance to be accountable and effective. From an accountability perspective, the pluralist approach provides a needed check on centralized decision-making at the global level, such as for the production of aggregate efforts public goods. From the perspective of effectiveness, international law is more likely to be implemented if it engages and takes account of state perceptions and concerns through pluralist interaction. Legal pluralists focus on the potential pathologies of centralized institutions and the role of pluralism in checking these pathologies. Krisch shows how, in our current socio-political context, the interaction of pluralist legal orders can produce superior ordering to a constitutionalism that is based on hierarchic, centralized decision-making, since mutual accommodation that can result from pluralist interaction will be grounded in greater legitimacy.60 Krisch illustrates, for example, how the UN Security Council reassessed and revised its procedures regarding the freezing of individuals’ assets in the ‘war on terror’ in light of due process concerns, only after states and other actors challenged and resisted implementation of its resolutions.61 Delmas-Marty demonstrates how pluralism can also lead to a unification of legal norms based on a ‘hybrid’ melding of different ‘ensembles’ of law, rather than on hegemony.62 Such a pluralist hybrid is more legitimate, in that it takes into account, and borrows from, different national legal systems. Because it is more legitimate, it is more likely to be implemented in practice by states. Ultimately, international law depends on national implementation. Concerns over implementation are particularly salient regarding weakest link public goods. If an infectious disease is to be eradicated, for example, then capacity must be built in a weakest link state. Otherwise, centralized decision-making will be ineffective. Weakest link global public goods highlight the need for pluralist interaction with states having meaningful capacity to engage with policies, such as disease eradication. Take, for example, the distribution of antiretroviral drugs to combat the AIDS crisis. Their effective use for constraining the epidemic’s ravages are enhanced where developing countries have the capacity to provide meaningful input to tailor policies and to carry out such tailored programmes effectively. C The Global Administrative Law Approach The global administrative law approach helps to address the deficiencies of the global constitutional vision through providing other accountability mechanisms, derived from national administrative law, which can be used to check centralized international decision-making.63 As national governments grew during the twentieth century in response to the growing complexity of national public goods challenges, legislatures delegated increasing powers to agencies. States correspondingly developed administrative law accountability mechanisms to apply to agencies, given that legislatures were unable to oversee them sufficiently. International institutions can be viewed analogously to national government agencies, in that both involve a delegation of power to an unelected body. The accountability mechanisms highlighted by the global administrative law pro ject are pragmatically useful for governing the production of global public goods. They include transparency and access to information; engagement with civil society and with national parliaments; monitoring, inspection, reporting, and notice and comment procedures; reason-giving requirements; substantive standards, such as proportionality, that must be met; and judicial review.64 These accountability mechanisms can be developed through international treaties, such as under the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters,65 and through national and international judicial decisions. Decision-making within international institutions must be overseen, in particular, through private groups placing pressure on public representatives. Making international decision-making more transparent facilitates such processes. To give one example of the usefulness of the global administrative law framework in the context of global public health, the WHO is increasingly engaging in public–private partnerships for innovative drug development because of the challenges of obtaining sufficient public financing.66 These partnerships raise conflicts-of-interest concerns that a global administrative law model can help to address through transparency and other administrative law mechanisms. The global administrative law model also offers the advantage of being applicable to national decision-making over the production of global public goods, thus providing checks on decentralization under a legal pluralist model. As we have seen, the deployment of best shot global public goods, such as technologies for asteroid deflection and climate engineering, may not require an international institution. Yet, the externalities involved in their deployment by states calls for accountability checks. Such national decision-making can be subject to due process requirements and to monitoring and review before international administrative bodies and courts. The WTO Shrimp–Turtle case provides an excellent example. The US exercised unilateral action to help preserve an endangered species on the high seas (a global public good). Its efforts, however, had significant implications for developing countries and their traders. The WTO Appellate Body successfully pressed the US to change its administrative law procedures better to assure due process review of the situations and concerns of these countries and their traders.67 Nonetheless, despite its many attributes, the global administrative law approach is rather technocratic and thus lacks ambition regarding larger scale questions of governance requiring political decision-making for the production of global public goods. Each of these three leading analytic frameworks for assessing law’s role in global governance focuses in a different way on the issues of accountability and legitimacy. Their relative attributes can be assessed in relation to different global public goods. For the production of aggregate efforts public goods where more centralization is needed, the legal pluralist vision is particularly insufficient. The global constitutionalist perspective, which legal pluralists have criticized, offers a complementary frame for building and critically scrutinizing centralized international institutions to which important secondary rule-making powers are delegated in light of imminent global public goods challenges, such as over international security and climate change. The global administrative law project has been particularly important in providing practical tools drawn from domestic administrative law for enhancing the accountability of decision-making in the production of global public goods, whether at the international or at the national level. The case of best shot public goods, for example, illustrates concerns regarding decision-making at the national level. Finally, the challenges of weakest link public goods highlight the need for ongoing interaction between centralized entities and nation states if international law and policy are to be implemented effectively. Each approach, in short, has attributes and deficiencies, involving trade-offs and potential complementarities. They should be viewed in comparative institutional analytic terms in relation to different global public goods challenges. Table 2 summarizes our discussion.68 Although these analytic approaches are sometimes advanced as alternatives, they play important complementary roles for enhancing the legitimacy of the international institutions that we need to produce different types of global public goods. 6 International Law as Facilitator of, and Potential Constraint on, the Production of Global Public Goods Law (in general) and international law (in particular) can be viewed as a public good in providing for order and stability.69 Law (in general) and international law (in particular) also can be viewed as an intermediate public good that facilitates the production of final substantive public goods – such as the avoidance of ozone depletion, the provision of a stable climate through mitigation and geoengineering, financial stability, and peace between nations.70 International law and institutions help to overcome collective action and free rider problems. They facilitate interaction that can produce shared understandings and common purposes. And they help to manage the frictions between pluralist legal orders that govern different public goods. In this way, international law helps to provide for public order. However, international law, in its prescriptive and proscriptive forms, can also constrain the production of global public goods. It may do so by creating positive or negative obligations that interfere with their production. Some contend, for example, that the positive obligations under the WTO TRIPs Agreement and other international intellectual property conventions reduce the supply of knowledge and constrain the protection of public health.71 Others contend that the negative obligations provided in other WTO agreements could constrain needed national action on climate change, such as through carbon taxes, an emissions-trading system, or a product ‘life cycle’ labelling regime.72 To the extent that decisions under the Convention on Biodiversity limit research on geoengineering, they too are suspect.73 Unilateral action is problematic because it can be self-serving and fail to take account of the values and perspectives of affected others. Yet unilateral action may also be an important part of a broader transnational process leading to the production of a global public good over time. In a world of interacting legal orders, certain actors will have to act, sometimes unilaterally, to catalyse international and global action. These actors most likely will exercise some form of power, such as market power wielded by the US and EU. To advance climate change policies globally, the US or EU may need to take unilateral action by creating its own internal system and then imposing some form of a border tax adjustment or penalty applied to applicable imports and cross-border services from countries that do not have a remediation system of comparable effectiveness.74 In a world without centralization and hierarchy, there will often be a need for unilateral action to spur the production of global public goods by inciting reactions and interactions which lead to the emergence of international law and international institutions to govern conflicts and maintain order. In practice, unilateralism may help to produce a global public good where common action fails, especially in light of opt-in rules under international treaties. Although international law can help to produce global public goods, it also can get in the way of their production. The possibility of unilateral action is not available to all, and the results often reflect biases. For example, John Yoo has written of global security as a public good which is not provided by global institutions in order to justify US intervention in Iraq and other unilateral policies.75 The example of Iraq makes clear the need for some form of international constraint on unilateral action so that a nation must justify its acts and take into account their impact on others. The WTO provides such a possibility in the area of regulation. It creates constraints and has a mandatory dispute settlement system to hear legal complaints, backed by sanctions. Its dispute settlement system can press a country to negotiate in good faith with third countries and create internal administrative law mechanisms in which non-citizens’ interests are heard. These constraints are less binding in other areas, such as international security, as represented by the US invasion of Iraq, NATO’s intervention in Kosovo, and US missile and drone attacks in the territories of other states. In sum, international law represents an important ‘constraint on the unilateral definition of a global public good’.76 The stringency of this constraint, however, should vary in light of the objective at stake, the effectiveness of a multilateral alternative, and the possibility that the national measure can take better account of its implications on outsiders in an unbiased manner. There are thus compelling reasons to refocus attention from public international law to processes of transnational legal ordering in which international law is one element in a broader interactive process. 7 Conclusion Globalization pressures transform issues that formerly were national in scope into global ones. With globalization, national decision-making increasingly has externalities on outsiders, and it is increasingly insufficient to attain national goals. International law and institutions thus rise in importance. Choices over the terms of international law, however, have distributive consequences, and the choice among global public goods and their funding involves rivalry. As a result, the key normative question becomes a comparative institutional one: that is, under what conditions are more or less centralization and hierarchy preferable? While the choice among alternatives may be complicated at the national level, the choice becomes much more so at the international level where problems of numbers and complexity multiply. The global public goods framework helps us to see both the attributes and limits of a legal pluralist approach toward international law and institutions. Legal pluralism’s starting assumption is about the need for communities to have a voice in shaping their own destinies. It thus distrusts order imposed by hierarchical, centralized institutional authority. The starting assumption for the production of many global public goods, in contrast, is the need for collective action to cooperate for common benefits. These starting points create a tension. There are risks of too much comfort with the legal pluralist framework as an organizing concept for the production of global public goods. But there are parallel risks with legitimizing centralized international decision-making without global democratic checks. Comparative institutional analysis is thus required which is tailored to the particular challenges raised by the production of different global public goods. International law will play a critical role by facilitating the creation, maintenance, oversight, and constraint of centralized international institutions, and the monitoring and review of national institutions, in relation to decision-making implicating the production of global public goods in different contexts. Given the varying contexts of different global public goods, there is no single best, universalist approach. Rather, a pragmatic approach is required in relation to different types of public goods and real world institutional limits. These strategies must include greater international centralization (for which constitutional principles are needed), multi-level institutional interaction (highlighting the key role of pluralism), and hybrids that include public–private partnerships (for which administrative law principles are required).

#### New Pandemics are deadlier and faster are coming – COVID is just the beginning

Antonelli 20 Ashley Fuoco Antonelli 5-15-2020 <https://www.advisory.com/daily-briefing/2020/05/15/weekly-line> "Weekly line: Why deadly disease outbreaks could become more common—even after Covid-19" (Associate Editor — American Health Line)//Elmer

While the new coronavirus pandemic suddenly took the world by storm, the truth is public health experts for years have warned that a virus similar to the new coronavirus would cause the next pandemic—and they say **deadly infectious disease outbreaks could become more common**. Infectious disease experts are always on the lookout for the next pandemic, and in a report published two years ago, researchers from the Johns Hopkins Bloomberg School of Public Health **predicted that the pathogen most likely to cause the next pandemic would be a virus similar to the common cold**. Specifically, the researchers predicted that the pathogen at fault for the next pandemic would be: A microbe for which people have not yet **developed immunities**, meaning that a large portion of the human population would be susceptible to infection; Contagious during the so-called "incubation period"—the time when people are infected with a pathogen but are not yet showing symptoms of the infection or are showing only mild symptoms; and Resistant to any known prevention or treatment methods. The researchers also concluded that such a pathogen would have a "low but significant" fatality rate, meaning the pathogen wouldn't kill human hosts fast enough to inhibit its spread. As **Amesh Adalja**—a senior scholar at the Johns Hopkins Center for Health Security, who led the report—told Live Science's Rachael Rettner at the time, "**It just has to make a lot of people sick" to disrupt society**. The researchers said RNA viruses—which include the common cold, influenza, and severe acute respiratory syndrome (or SARS, which is caused by a type of coronavirus)—fit that bill. And even though we had a good bit of experience dealing with common RNA viruses like the flu, Adalja at the time told Rettner that there were "a whole host of viral families that get very little attention when it comes to pandemic preparedness." Not even two years later, the new coronavirus, which causes Covid-19, emerged and quickly spread throughout the world, reaching pandemic status in just a few months. To date, officials have reported more than 4.4 million cases of Covid-19 and 302,160 deaths tied to the new coronavirus globally. In the United States, the number of reported Covid-19 cases has reached more than 1.4 million and the number of reported deaths tied to the new coronavirus has risen to nearly 86,000 in just over three months. Although public health experts had warned about the likelihood of a respiratory-borne RNA virus causing the next global pandemic, many say the world was largely unprepared to handle this type of infectious disease outbreak. And as concerning as that revelation may be on its own, **perhaps even more worrisome is that public health experts predict life-threatening infectious disease outbreaks are likely to become more common—meaning we could be susceptible to another pandemic in the future**. Why experts think deadly infectious disease outbreaks could become more common As the Los Angeles Times's Joshua Emerson Smith notes, infectious disease experts for more than ten years now have noted that "[o]utbreaks of dangerous new diseases with the potential to become pandemics have been on the rise—from HIV to swine flu to SARS to Ebola." For instance, a report published in Nature in 2008 found that **the number of emerging infectious disease events that occurred in the 1990s was more than three times higher than it was in the 1940s**. Many experts believe the recent increase in infectious disease outbreaks is tied to human behaviors that disrupt the environment, "such as **deforestation and poaching**," which have led "to increased contact between highly mobile, urbanized human populations and wild animals," Emerson Smith writes. In the 2008 report, for example, researchers noted that about 60% of 355 emerging infectious disease events that occurred over a 50-year period could be largely linked to wild animals, livestock, and, to a lesser extent, pets. Now, researchers believe the new coronavirus first jumped to humans from animals at a wildlife market in Wuhan, China. Along those same lines, some experts have argued that global climate change has driven an increase in infectious diseases—and could continue to do so. A federally mandated report released by the U.S. Global Change Research Program in 2018 warned that warmer temperatures could expand the geographic range covered by disease-carrying insects and pests, which could result in more Americans being exposed to ticks carrying Lyme disease and mosquitos carrying the dengue, West Nile, and Zika viruses. And experts now say continued warming in global temperatures, deforestation, and other environmentally disruptive behaviors have broadened that risk by bringing more people into contact with disease-carrying animals. Further, experts note that infectious diseases today are able to spread much faster and farther than they could decades ago because of increasing globalization and travel. While some have suggested the Covid-19 pandemic could stifle that trend, others argue globalization is likely to continue—meaning so could infectious diseases' far spread.

#### Future pandemics will cause extinction

Bar-Yam 16 Yaneer Bar-Yam 7-3-2016 “Transition to extinction: Pandemics in a connected world” <http://necsi.edu/research/social/pandemics/transition> (Professor and President, New England Complex System Institute; PhD in Physics, MIT)//Elmer

Watch as one of the more aggressive—brighter red — strains rapidly expands. After a time it goes extinct leaving a black region. Why does it go extinct? The answer is that it spreads so rapidly that it kills the hosts around it. Without new hosts to infect it then dies out itself. That the rapidly spreading pathogens die out has important implications for evolutionary research which we have talked about elsewhere [1–7]. In the research I want to discuss here, what we were interested in is the effect of adding long range transportation [8]. This includes natural means of dispersal as well as unintentional dispersal by humans, like adding airplane routes, which is being done by real world airlines (Figure 2). When we introduce long range transportation into the model, the success of more aggressive strains changes. They can use the long range transportation to find new hosts and escape local extinction. Figure 3 shows that the more transportation routes introduced into the model, the more higher aggressive pathogens are able to survive and spread. As we add more long range transportation, there is a critical point at which pathogens become so aggressive that the entire host population dies. The pathogens die at the same time, but that is not exactly a consolation to the hosts. We call this the phase transition to extinction (Figure 4). With increasing levels of global transportation, human civilization may be approaching such a critical threshold. In the paper we wrote in 2006 about the dangers of global transportation for pathogen evolution and pandemics [8], we mentioned the risk from Ebola. Ebola is a horrendous disease that was present only in isolated villages in Africa. It was far away from the rest of the world only because of that isolation. Since Africa was developing, it was only a matter of time before it reached population centers and airports. While the model is about evolution, it is really about which pathogens will be found in a system that is highly connected, and Ebola can spread in a highly connected world. The traditional approach to public health uses historical evidence analyzed statistically to assess the potential impacts of a disease. As a result, many were surprised by the spread of Ebola through West Africa in 2014. As the connectivity of the world increases, past experience is not a good guide to future events. A key point about the phase transition to extinction is its suddenness. Even a system that seems stable, can be destabilized by a few more long-range connections, and connectivity is continuing to increase. So how close are we to the tipping point? We don’t know but it would be good to find out before it happens. While Ebola ravaged three countries in West Africa, it only resulted in a handful of cases outside that region. One possible reason is that many of the airlines that fly to west Africa stopped or reduced flights during the epidemic [9]. In the absence of a clear connection, public health authorities who downplayed the dangers of the epidemic spreading to the West might seem to be vindicated. As with the choice of airlines to stop flying to west Africa, our analysis didn’t take into consideration how people respond to epidemics. It does tell us what the outcome will be unless we respond fast enough and well enough to stop the spread of future diseases, which may not be the same as the ones we saw in the past. As the world becomes more connected, the dangers increase. Are people in western countries safe because of higher quality health systems? Countries like the U.S. have highly skewed networks of social interactions with some very highly connected individuals that can be “superspreaders.” The chances of such an individual becoming infected may be low but events like a mass outbreak pose a much greater risk if they do happen. If a sick food service worker in an airport infects 100 passengers, or a contagion event happens in mass transportation, an outbreak could very well prove unstoppable

# **Space Militarization**

#### Space militarization is a key issue due to the lack of regulation around it, becomes inevitable, especially through privatization.

**ICRC, 2017**

ICRC, “Space law revisited : The militarization of outer space”, Red Cross, 2017, 2-16-2022

**Outer space is becoming an arena for technological shows of force** — whether by deployment of spy satellites or testing of weapons. What does international space law have to say on the militarization of space? In this three-post series (see here), Pavle Kilibarda (Geneva Academy) attempts a broader interpretation of the norms, one that would lead to a more pacifist reading of the law. nternational space law’s bedrock document, **the 1967 Outer Space Treaty, refers** to outer space as the “province of all mankind” (Art. I), **the exploration and use of which “for peaceful purposes”** is the common interest of humanity (Preamble**). This, however, hasn’t actually facilitated consensus as to whether or not space may actually be used for military purposes.** Outer space — generally taken as everything more than 100 km above the Earth’s surface — is becoming an emerging arena for any technological shows of force, be it the deployment of spy satellites or the testing of weapons (as was the case, for example, with China’s destruction of one of its old weather satellites by a prototype anti-satellite missile). The fact that a **large number of States have been calling for the adoption of a treaty** on the prevention of an arms race in space for decades now, and more recently with renewed vigour, **demonstrates the international community’s belief that the existing legal regime is inadequate for halting the encroaching militarization** of space. This should serve as a reason to re-examine what existing space law actually has to say on this issue.

#### BUT Space militarization is solved through international agreements making them key to solve prevent power war. US commitment gives impetus towards agreement—empirically proven by ASAT testing.

Hitchens 7 [(Theresa, Theresa Hitchens is a senior research scholar at the University of Maryland’s Center for International and Security Studies at Maryland (CISSM) and former director of the United Nations Institute for Disarmament Research (UNIDIR).). "US-Sino Relations in Space: From ‘War of Words’ to Cold War in Space?”." China Security 3.1 (2007): 12-30.]

Given that the United States and China now seem poised at the precipice of a dangerous competition to develop and deploy ASATs and other counter-space capabilities – a competition that threatens to draw in other players are well – what are the options for the wider international community in attempting to prevent Washington and Beijing from falling over the edge? The unfortunate truth is that there are not many, beyond continued diplomatic efforts to encourage both sides to tread more carefully. That said, those nations and international institutions committed to a weapons-free space environment should not throw up their hands in despair, but rather work together to reconsider how to push forward a collective space security agenda that can serve mutual interests rather than fan competition. If there is a silver lining to the current situation, it has raised the issue of space debris to a higher political level than ever before – and elicited a new commitment on the part of the U.S. government to refrain from testing debris-creating ASATs. “We don’t believe anyone should be doing these kinds of activities,” U.S. State Department deputy spokesman Tom Casey said Jan. 19.50 It is hoped that the planned meeting of the UN Committee for Peaceful Uses of Outer Space in February in Vienna (the discussions on debris are currently slated for Feb. 19-20 although the schedule may change),51 where delegates (including Chinese representatives, which up to now have been active proponents of the effort) were to discuss and hopefully approve a set of debris mitigation guidelines, is not derailed, but instead is given more impetus towards an agreement. One of the tenets of that agreement, according to diplomats involved, is that signatories pledge not to deliberately create space debris. While the accord would be voluntary, it would certainly make future destructive ASAT weapons tests by any of the signatories much more difficult to justify. It may also be that both the Committee for Peaceful Uses of Outer Space and the Conference on Disarmament will now be willing to consider a more specific, legally binding, accord that would bar the testing and use of weaponry that would create significant persistent debris. Certainly, it is in the interest of no spacefaring power for near-Earth orbit to become so polluted as to become unusable – an outcome that cannot be ruled out over the long-term in a weaponized space environment. But even in the short-term, an increase in the threat from space debris could have negative consequences for space-faring nations and space operators. A report on the potential market impacts of the Chinese ASAT test by U.S. market consulting firm Teal Group found: “About the last thing that the satellite market needs now is the uncertainty that will accompany any moves to start blowing up objects in space or arming military satellites with protective countermeasures. The added debris problem is bad enough. An ASAT weapons race will have the effect of increasing the financial risk of any satellite program, and this will undoubtedly be felt most within the commercial market through decreased investor confidence and(or) higher insurance rates.”52 Further, the fact that it will take months for a clear picture of the debris impact of the Chinese test to emerge should encourage all space-faring nations to invest more in capabilities to survey the space environment, and to consider how they can work together to improve debris monitoring. While the United States has the world’s most comprehensive space surveillance system, it is widely acknowledged that it has gaps and process problems that need to be addressed. Other nations have spot-check capabilities that could be used to provide additional data and augment U.S. capabilities – provided that nations were willing to work out data-sharing protocols. In particular, the European Union should now move forward with its nascent plan to develop a European space surveillance network and work with the United States to ensure compatibility. Finally, the United States and China need to recognize that they must make an effort to manage their emerging competition in military space in a manner that does not undercut their own national security, as well as the security of others. Breaking off nascent discussions about space cooperation in favor of launching a kind of Cold War in space is bound to backfire on both Washington and Beijing in the long run. Instead, a frank and open dialogue about each side’s national security concerns in space is called for – along with serious consideration of how a new code of conduct for behavior in space might be drafted to clearly demark the boundaries of acceptable and unacceptable behavior in space. A code of conduct for space is not a radical, or even new, idea. Indeed, the administration of Ronald Reagan, while pursuing space-based missile defenses and an ASAT program, also was considering the value of pursuing a code of conduct that might include measures such as barring attacks on early warning satellites.53 Pursuit of a space code more recently has been endorsed by a number of international media outlets, including The Economist, a libertarian-oriented British magazine, and U.S. trade journal Aviation Week & Space Technology. 54 China and the United States should take heed, and seek to shape rules of the road that can help ensure mutual security in space for all. Failure to act to restrain unfettered military competition in space is bound to result in a “Wild West” environment that raises the risks not only to Chinese and U.S. uses of space, but to the peace and prosperity of the entire world.

#### US-China space war goes nuclear, draws in other powers

Fabian 19 [Christopher David Fabian, Bachelor of Science, United States Air Force Academy. (“A Neoclassical Realist’s Analysis Of Sino-U.S. Space Policy”, *University of North Dakota Scholarly Commons*, January, Available Online at: <https://commons.und.edu/cgi/viewcontent.cgi?article=3456&context=theses>]

Second, Chinese strikes on U.S. space assets must not result in uncontrolled escalation. The advantage of possessing soft-kill technology is the suitability for low-intensity conflicts, while the use of destructive/non-reversible attacks will not be constrained during high-intensity conflicts.234 The use of exclusively non-lethal versus a combination of lethal and non-lethal capabilities can serve as strategic signaling about the phase of combat. However, due to a capability and vulnerability gap, combined with a lack of credible retaliatory threat, a tit-for-tat strategy along a clearly defined escalation ladder may not be a legitimate strategy for the Sino-U.S. relationship. 235 Counterspace action intended to have a tactical/operational effect may cross American strategic red lines, resulting in unintended escalation. For example, an attack on American overhead persistent infrared (OPIR) sensors would degrade their capability to detect conventional medium range ballistic missiles, with targets in the first island chain also interfering with the early detection of nuclear capable ICBMs launched against the U.S.236 Concerningly enough, there is evidence that the implication of interfering with or destroying strategically important U.S. capabilities has only been appreciated on the tactical and operational levels within the Chinese military.

237 Similarly, a Chinese attack on U.S. space systems at the outset of a low-grade conflict could raise the likelihood of a “space Pearl Harbor,” which could, in turn, provoke the United States to contemplate pre-emptive attacks or horizontal escalation on the Chinese mainland.238 In addition, commercial-military integration and combined efforts may result in escalation with third parties. A significant portion of U.S. military communication and imaging capabilities are purchased from commercial companies or provided by allied nations, meaning that to adequately degrade U.S. military capabilities, an attack on non-military and/or non-U.S. assets is required.

#### Independently, declining to give effect to international law in US courts cedes influence to foreign governments whose interests undermine US influence.

Coyle 15 [John F., Assistant Professor of Law, University of North Carolina at Chapel Hill. The Case for Writing International Law into the U.S. Code, 56 B.C.L. Rev. 433 (2015), http://lawdigitalcommons.bc.edu/bclr/vol56/iss2/2]

The overwhelming majority of international law is today—and has long been—enforced in national courts. 1 In the United States, courts are regularly called upon to give effect to treaties relating to the liability of air carriers, the enforceability of international sales contracts, and the protection of intellectual property, among other areas. 2 These courts also occasionally hear cases involving the application of customary international law.3 Over the past few decades, however, the judiciary has taken steps to limit the direct role played by international law in the U.S. legal system.4 In a number of recent decisions, the U.S. Supreme Court has evinced what one commentator describes as a “visceral resistance to treating modern international law in both treaty and customary form as law of the United States.”5 Similarly, the federal courts of appeal have exhibited a marked reluctance to give direct effect to customary international law or treaties to which the United States has long been a party. 6

This persistent judicial reluctance to directly enforce international law rules is normatively undesirable for two reasons. First, if U.S. courts consistently decline to give effect to international law, litigants will often lack any forum in which to bring claims sounding in international law because individuals rarely have standing to appear before international tribunals.7 Viewed from a litigant’s perspective, therefore, the recent judicial retreat from international law raises the possibility that that law will confer a right for which there exists no remedy.8 Second, if U.S. courts consistently decline to give effect to international law, they will lose their ability to influence the development of that law. Viewed from the perspective of the United States, therefore, the recent judicial retreat from international law raises the possibility that that law will increasingly be shaped by foreign courts and tribunals whose long-term interests may not be consistent with those of the United States.9

#### US multilateral institutional influence key to hegemony

Burke-White 21 [(William, Nonresident Senior Fellow - Foreign Policy, Center for Security, Strategy, and Technology, Project on International Order and Strategy) 2-25-2021 A new geostrategic environment demands new principles for US multilateral diplomacy Brookings https://www.brookings.edu/blog/order-from-chaos/2021/02/25/a-new-geostrategic-environment-demands-new-principles-for-us-multilateral-diplomacy/]

The world Biden inherited is not that of President Obama in 2009, much less that of President Clinton in 1993. Three significant shifts have altered the geostrategic context. First, despite the fact that the United States served as the primary architect of the international institutional order some 75 years ago, today it is as a relative outsider in the multilateral policy space. Under the Trump administration, the United States exited numerous international organizations, stepped back from leadership roles and withdrew from significant international legal commitments. These exits include, to name but a few, the U.N. Human Rights Council, the World Health Organization, the U.N. Economic Social and Cultural Organization, the Paris climate accord, the Trans-Pacific Partnership, the Open Skies Treaty, the Intermediate-Range Nuclear Forces Treaty and the Global Compact on Migration. As the United States has retreated over the past four years, its allies and adversaries alike have doubted, questioned and even challenged its leadership. President Biden’s quick reversal of some of these exits does not change the broader trend, nor the world’s perception thereof. Second, China has fully emerged as a rival in multilateral affairs. Under President Xi Jinping, China has meaningfully enhanced its prominence in the multilateral system both by virtue of its increasing geopolitical power and by its strategic efforts to set the agenda within multilateral institutions. Chinese nationals now lead four of the 15 U.N. specialized agencies — far more than any other country. China is actively asserting its newfound influence to steer multilateral institutions toward its own interests. The vast financial commitment of the Belt and Road Initiative has given China significant new leverage over individual countries across the globe. It is now demonstrating a willingness to tie these financial commitments to support in multilateral policy settings. China’s expanding leadership sends a powerful signal to the world that its position and interests must be respected, even if at the United States’s expense. Third, multilateral policy has become politically divisive at home. For most of the past 75 years, the basic U.S. commitment to the international order has stood strong. Today, however, the United States finds itself deeply divided as to whether leadership of the international order remains in the U.S. national interest. Growing skepticism of international institutions and commitments in both political parties will require the new administration to carefully steward limited political capital. Notwithstanding the incoherence of Trump’s “America First” foreign policy, it created political space within the Republican Party to question the value of international institutions, the utility of multilateral policy and the benefits of a global order. Within the Democratic Party, populist and progressive voices alike are questioning the alignment of the international order with Americans’ values and interests. This altered landscape demands a new approach, including decisive shifts in the strategy and tactics the U.S. employs in the international institutional system. A new set of principles — not just a few announcements of reentries — must guide America’s multilateral strategy in this new era. Dubbed “The Philadelphia Principles” — drawing on Ben Franklin’s legacy (after all, President Biden was the Benjamin Franklin Presidential Professor at Penn) — these principles offer new ways to frame U.S. multilateral efforts at the global level, among our partners and allies, and in our own domestic and bureaucratic politics. (You can read the principles here.) Collectively, they position the United States to better advance core interests through the tools of multilateralism in a competitive geostrategic environment. First, at the global level, the multilateral order is now defined by great power competition, especially with China. China’s far more assertive approach in multilateral institutions and its quest for leadership roles within those institutions will accelerate. For the United States to effectively advance its own interests in this context, it too must be willing to compete in multilateral settings. The United States must be vigilant of and prepared to check competitors’ efforts to alter norms or assert authority within the full range of multilateral institutions, including less prominent ones. It must develop new approaches to working with competitors where interests align, without being seduced into believing the international environment is fundamentally one of cooperation. Negotiating a revised version of the Trans-Pacific Partnership that advances the economic interests of Americans and eventually ratifying the U.N. Convention on the Law of the Sea must be centerpieces of an effort to check China’s regional and global economic ambitions. Second, addressing transnational threats, especially climate change, must be a fundamental goal of U.S. multilateral strategy. Climate change, unregulated human movement, and pandemic disease present growing and potentially existential threats to the United States and the globe. Multilateral policy coordination is indispensable to any effective approaches to mitigating, managing and preventing these threats. While bearing in mind the environment of great power competition in which multilateral policy now operates, the United States must focus its multilateral efforts to an ever-greater degree on collective global responses to transnational threats. Such efforts must establish and affirm basic norms and rules to govern transnational issues, encourage deeper commitment and compliance by broad coalitions of states, and strengthen institutional architectures for implementation, monitoring and enforcement. Specifically, the U.S. must truly recommit to the U.N. Framework Convention on Climate Change (UNFCCC) and drive the reform of the World Health Organization. Third, in working with allies and partners, multilateral engagement should start with countries that share the United States’s values and commitment to democracy. In building coalitions, establishing cooperation, or designing club governance models, U.S. multilateralism must begin with a shared commitment to a core set of common values, including democratic governance and human rights. Building coalitions of states that share these values is ultimately the best way to confront great power rivals. Groups of states bound together by shared values and commitments to democratic governance may also be able to build redundancies into the international institutional architecture to step in where universal institutions are gridlocked or ineffective. In restoring its commitment to rights and democracy, the United States also clearly signals to the global community that it lives by the values it expects of its partners, thereby enhancing its credibility at a time when U.S. reliability is in doubt. The U.S. should begin this effort through tangible human rights and racial justice commitments at home while reflecting these values internationally. Fourth, successful multilateralism requires the strategic use of multiple institutions, including informal processes, club models and nonbinding commitments. Where traditional institutions appear ineffective due to political gridlock, lack of policy consensus, and the growing influence of U.S. rivals, the United States must be ready to turn to or even build new institutional structures, just as U.S. rivals have done. For any given issue, the United States must carefully and strategically select the institution(s) most likely to be effective in the context of great power rivalry and work across multiple institutions simultaneously. The United States should also become a leader in the establishment and operation of club-model governance structures, particularly in the climate space, where they can offer promising ways of managing limited public goods resources in a competitive environment. Fifth, in U.S. domestic politics and bureaucratic processes, multilateral policy must be better integrated into global diplomatic strategy. Within the U.S. government, multilateral policy has long operated in its own bureaucratic and diplomatic silo, walled off from and usually secondary to bilateral diplomacy. In today’s more competitive global landscape, effective multilateralism requires deeper integration of these two co-equal pillars of diplomacy. While the United States should not adopt China’s transactional approach to these linkages, it must be prepared to respond when competitors make explicit bargains that leverage bilateral and multilateral diplomacy. Bureaucratic reforms must be undertaken at the Department of State and the National Security Council to better align the two pillars of U.S. diplomacy. Sixth, multilateral objectives must align with the interests of the American people and the values the United States seeks to embody at home. Fundamentally, the purpose of multilateralism must be to advance the interests of the American people, yet economic and political shifts of past decades have led many Americans, particularly the middle class, to question the value of the international order. To restore the confidence of the American people in multilateralism, the U.S. government must better understand the interests of the majority of the American people and ensure that the U.S. multilateral agenda aligns with those interests. So too, the U.S. government must better communicate how multilateral leadership and international institutional engagement make America safer, stronger and more prosperous.

#### Primacy and allied commitments through international law and relations solve arms races and great power war – unipolarity is sustainable, and prevents power vacuums and global escalation which can lead to extinction

Brands 18 [(Hal, Henry Kissinger Distinguished Professor at Johns Hopkins University's School of Advanced International Studies and a senior fellow at the Center for Strategic and Budgetary Assessments) "American Grand Strategy in the Age of Trump," Page 129-133]

Since World War II, the United States has had a military second to none. Since the Cold War, America has committed to having overwhelming military primacy. The idea, as George W. Bush declared in 2002, that America must possess “strengths beyond challenge” has featured in every major U.S. strategy document for a quarter century; it has also been reflected in concrete terms.6

From the early 1990s, for example, the United States consistently accounted for around 35 to 45 percent of world defense spending and maintained peerless global power-projection capabilities.7 Perhaps more important, U.S. primacy was also unrivaled in key overseas strategic regions—Europe, East Asia, the Middle East. From thrashing Saddam Hussein’s million-man Iraqi military during Operation Desert Storm, to deploying—with impunity—two carrier strike groups off Taiwan during the China-Taiwan crisis of 1995– 96, Washington has been able to project military power superior to anything a regional rival could employ even on its own geopolitical doorstep.

This military dominance has constituted the hard-power backbone of an ambitious global strategy. After the Cold War, U.S. policymakers committed to averting a return to the unstable multipolarity of earlier eras, and to perpetuating the more favorable unipolar order. They committed to building on the successes of the postwar era by further advancing liberal political values and an open international economy, and to suppressing international scourges such as rogue states, nuclear proliferation, and catastrophic terrorism. And because they recognized that military force remained the ultima ratio regum, they understood the centrality of military preponderance.

Washington would need the military power necessary to underwrite worldwide alliance commitments. It would have to preserve substantial overmatch versus any potential great-power rival. It must be able to answer the sharpest challenges to the international system, such as Saddam’s invasion of Kuwait in 1990 or jihadist extremism after 9/11. Finally, because prevailing global norms generally reflect hard-power realities, America would need the superiority to assure that its own values remained ascendant. It was impolitic to say that U.S. strategy and the international order required “strengths beyond challenge,” but it was not at all inaccurate.

American primacy, moreover, was eminently affordable. At the height of the Cold War, the United States spent over 12 percent of GDP on defense. Since the mid-1990s, the number has usually been between 3 and 4 percent.8 In a historically favorable international environment, Washington could enjoy primacy—and its geopolitical fruits—on the cheap.

Yet U.S. strategy also heeded, at least until recently, the fact that there was a limit to how cheaply that primacy could be had. The American military did shrink significantly during the 1990s, but U.S. officials understood that if Washington cut back too far, its primacy would erode to a point where it ceased to deliver its geopolitical benefits. Alliances would lose credibility; the stability of key regions would be eroded; rivals would be emboldened; international crises would go unaddressed. American primacy was thus like a reasonably priced insurance policy. It required nontrivial expenditures, but protected against far costlier outcomes.9 Washington paid its insurance premiums for two decades after the Cold War. But more recently American primacy and strategic solvency have been imperiled.

THE DARKENING HORIZON For most of the post–Cold War era, the international system was— by historical standards—remarkably benign. Dangers existed, and as the terrorist attacks of September 11, 2001, demonstrated, they could manifest with horrific effect. But for two decades after the Soviet collapse, the world was characterized by remarkably low levels of great-power competition, high levels of security in key theaters such as Europe and East Asia, and the comparative weakness of those “rogue” actors—Iran, Iraq, North Korea, al-Qaeda—who most aggressively challenged American power. During the 1990s, some observers even spoke of a “strategic pause,” the idea being that the end of the Cold War had afforded the United States a respite from normal levels of geopolitical danger and competition. Now, however, the strategic horizon is darkening, due to four factors.

First, great-power military competition is back. The world’s two leading authoritarian powers—China and Russia—are seeking regional hegemony, contesting global norms such as nonaggression and freedom of navigation, and developing the military punch to underwrite these ambitions. Notwithstanding severe economic and demographic problems, Russia has conducted a major military modernization emphasizing nuclear weapons, high-end conventional capabilities, and rapid-deployment and special operations forces— and utilized many of these capabilities in conflicts in Ukraine and Syria.10 China, meanwhile, has carried out a buildup of historic proportions, with constant-dollar defense outlays rising from US$26 billion in 1995 to US$226 billion in 2016.11 Ominously, these expenditures have funded development of power-projection and antiaccess/area denial (A2/AD) tools necessary to threaten China’s neighbors and complicate U.S. intervention on their behalf. Washington has grown accustomed to having a generational military lead; Russian and Chinese modernization efforts are now creating a far more competitive environment.

# Space Debris

#### Commercial rocket launches produce space clutter—increased debris could reach a tipping point and is only perpetuated by the explosion of the private sector

Thompson 20 [(Clive, author of Coders: The Making of a New Tribe and the Remaking of the World, a columnist for Wired magazine, and a contributing writer to The New York Times Magazine) “Monetizing the Final Frontier The strange new push for space privatization,” December 3, 2020 <https://newrepublic.com/article/160303/monetizing-final-frontier>] TDI

“Physics tells us that two things can’t occupy the same space at the same time or else bad things happen,” Jah said dryly. Indeed, there’s already been one collision that produced sprawling orbital pollution. In 2009, a satellite owned by the U.S. firm Iridium slammed into a decommissioned Russian government satellite at more than 26,000 mph. The crash produced 2,300 pieces of debris, spraying off in all directions. And debris is a particularly gnarly problem in space, because when it’s traveling at thousands of miles an hour, even a marble-size chunk is like a bullet, capable of rendering a damaged satellite inoperable and unsteerable—the owner can no longer fire its boosters to guide it into a higher or lower orbit. There are currently an estimated 500,000 marble-size chunks up there. Decades of space travel by governments left plenty of refuse, ranging from parts of rocket boosters to stray bits of scientific experiments. One particularly grim vision of the future that haunts astronomers is the “Kessler syndrome,” proposed by the astrophysicist Donald Kessler in 1978. Kessler hypothesized that space clutter could reach a tipping point: One really bad collision could produce so much junk that it would trigger a chain reaction of collisions. This disaster scenario would leave hundreds of satellites eventually destroyed, and create a ring of debris that would make launching any new satellites impossible, forever. “Near space is finite—it’s a finite resource,” Jah said. “So now you have this growing trash problem that isn’t being remediated.... And if we exceed the capacity of the environment to carry all this traffic safely, then it becomes unusable.” That’s why a growing chorus of critics are already making the case that space is the next major environmental area to protect, after the oceans and land on Earth. “People seem to really treat resources in space as being infinite,” said Erika Nesvold, an astrophysicist who’s the cofounder of The JustSpace Alliance. “As we’ve seen, people don’t really intuitively understand exponential growth.” That’s the dilemma in a nutshell: The available room in the sky is limited, but the plans for growth are exponential. SpaceX isn’t the only New Space firm looking to toss up satellites. Satellite and rocket start-ups are now lining up en masse, atop new waves of investment. There are satellites geared up to connect to “the internet of things” so companies can communicate among proprietary networks of household devices. There are floating cameras pointing down—so as to gather “geospatial intelligence,” which is to say data streamed from “the vantage point you get from satellites looking down on Earth and giving us information about our planet,” as the venture capitalist Anderson told me. And new forms of satellite vision are emerging all the time, such as cameras that can see at night, or are specially designed to see agriculture. Experiments abound, and so satellite launches will inevitably multiply in their wake. Part of what makes near-Earth orbit so chaotic is that it is, at the moment, remarkably unregulated—not unlike the internet of the early ’90s. An American firm has to get permission from the Federal Communications Commission to launch a satellite, but once it’s in orbit, there’s no federal agency that can compel it to move out of the path of a collision. Satellite owners generally don’t like to move if they can avoid it, because their satellites have a limited amount of fuel; any movement decreases their usable lifespan. On top of that, there are dozens of nations shooting satellites into low-Earth orbit—but no international body coordinating their flight paths. Last fall, the European Space Agency realized one of SpaceX’s new Starlink satellites was on a dangerously close path to an ESA satellite. SpaceX said it had no plans to move the satellite; so the ESA decided to fire its thrusters and get clear. This high-stakes negotiation was conducted via email. What’s more, space debris is extremely hard to source. If a British satellite slams into yours, you can probably figure out who hit you. But if your satellite is wrecked by a random piece of junk, nobody has any clue where that debris came from. It is, in this way, a neat parallel to the problem of C02, where a ceaseless barrage of tiny commercial decisions creates a sprawling problem—one that’s all but designed to ensure that everyone who caused it can deny responsibility. And damage is asymmetric: A company with a small $60,000 satellite could smash into a wildly expensive one paid for by U.S. taxpayers. “A National Reconnaissance Office satellite is at least a billion dollars, if not more, so they have a lot more to lose if something hits a satellite,” Bhavya Lal, a researcher at the IDA Science and Technology Policy Institute, noted. “As more private activity starts to happen, there’s more chances of that loss of control, too.” One might dismiss all this anxiety as a sort of sci-fi version of hippie environmentalism—except that even the administrator of NASA is deeply worried about the chaos and destruction likely to be sown by commercial activity in near-Earth orbit. Jim Bridenstine, the Trump-appointed head of NASA, is as pro-market as one can be. He praises SpaceX every chance he gets; he talks about privatizing the space station. But when I asked him about the looming danger of space debris, during a press-conference call, he conceded that it’s a huge, unresolved issue.

#### Privatized space tourism increases collision risks due to orbital debris.

Tehrani 4/1 [(James, Editor in Chief of Spark Magazine) “Space Junk: A Safety and Sustainability Problem Moving at 18,000 MPH,” April 1, 2021, <https://sphera.com/spark/space-junk-a-safety-and-sustainability-problem-moving-at-18000-mph/>] TDI

Most of the current debris is found in the low Earth orbit (LEO), which is about 600 to 1,200 miles (1,000 to 2,000 kilometers) above the planet. NASA calls LEO an “orbital space junkyard.” The junk isn’t sitting idly in a landfill; it is moving around at speeds up to 18,000 mph (29,000 kph), or 23 times the speed of sound. While the Inter-Agency Space Debris Coordination Committee was designed to coordinate space debris efforts, there are currently no international laws in place regarding removing space debris. Since a single satellite can cost between $50 million and $400 million, the risk of damage from space debris to a satellite is clearly significant. And as more debris is left behind, there is obviously more risk of collisions, especially when space tourism picks up. The orbiting junk was explored in the 2013 film “Gravity,” starring George Clooney and Sandra Bullock; it’s known as the Kessler Effect. Don Kessler, the former NASA scientist who studied space debris even told the Guardian back in 2011 in regard to formulating a plan to deal with space junk: “The longer you wait to do this, the more expensive it’s going to be. … This scenario of increasing space debris will play out even if we don’t put anything else in orbit,” he said. On that point, the European Space Agency has contracted with a Swiss startup called ClearSpace that plans to launch its first mission to remove space debris in 2025. The Gravity of the Situation Without a doubt, space debris is an Operational Risk; even the International Space Station has to dodge space junk at times. Former NASA Administrator Jim Bridenstine even tweeted last September that the “Space Station has maneuvered 3 times in 2020 to avoid debris. In the last 2 weeks, there have been 3 high concern potential conjunctions. Debris is getting worse!” Some of the larger debris that doesn’t burn up re-entering the atmosphere (about one object per day) even crashes back on Earth. Since most of the Earth’s surface is covered in water, it’s not surprisingly that most of the junk winds up in oceans, so the risk to humans is statistically very low. That doesn’t mean nil though. For example, there is debris from Russian Proton rockets that has been found in Siberia, including that of old fuel tanks containing toxic fuel residue, which can be harmful to plants, animals and humans. The environmental risks of space junk need to be explored further. A piece of space junk floating through the ocean is certainly not nearly as concerning as our plastic problem, but it’s nothing to ignore either. LCA Leads the Way Just as more and more companies are assessing the Life Cycle Assessment (LCA) of their products and services from cradle to grave on Planet Earth, it stands to reason that LCA could be just as important in outer space. That’s especially true when you consider space tourism is poised to blast off to become a potential $1.5 billion industry by 2028. The more activity, the more debris.

#### Increased space debris makes future space exploration impossible, turning the entire negative case

Webb 18 [(Amy Webb is a professor at the NYU Stern School of Business and is the chief executive of the Future Today Institute, a strategic foresight and research group in Washington, D.C.), “Space Oddities: We Need a Plan to Stop Polluting Space Before It’s Too Late” WIRED Science April 12, 2018 https://www.wired.com/story/we-need-a-plan-to-stop-polluting-space-before-its-too-late/] TDI

Space is our next dumping ground. As many as 170 million fragments of metal and astro debris necklace Earth. That includes 20,000 pieces larger than a softball, and 500,000 about the size of a marble, according to NASA. Old satellites, like Tiangong-1, are the biggest and highest-profile lumps of rubbish, but most of it comes from rocket parts and even lost astronaut tools. Size doesn’t always matter—a fleck of paint, orbiting at a high velocity, cracked the Space Shuttle's windshield.

This debris will pose a navigation hazard for many centuries to come. At least 200 objects roar back into the atmosphere each year, including pieces of solar panels and antennas and fragments of metal. All of them pose dangers for future astronauts: One plum-sized piece of gnarled space trash traveling faster than a speeding bullet could rip a five-foot hole into a spacecraft. And that collision, then, would hatch its own spectacle of shrapnel, which would join the rushing river of junk already circling the planet.

It’s not just Americans doing the dumping. China and Russia each have dozens of decommissioned satellites overhead, though the US certainly does it with style. Like everyone, I marveled at the successful launch of SpaceX’s Falcon Heavy rocket, whose cargo included Elon Musk’s Tesla Roaster and a mannequin driver named Starman. I’ll admit, I teared up listening to David Bowie as the rockets separated from the payload. It was an incredible technological achievement, one proving that the system could someday transport people and goods—perhaps real cars, and real people—into space.

Now that Tesla and its driver are overhead, in America’s junkyard in the sky. To be sure, space is big. Really big. Most debris soars about 1,250 miles above the Earth’s surface, so you have better odds scoring a seat on Virgin Galactic’s maiden voyage than witnessing Starman crash into your next door neighbor’s house. But it’s our behavior back here on Earth—our insistence on sending things up, without really thinking how to safely contain or send them back down—that should concern you.

We weren’t always so short-sighted. Ancient Native Americans lived by the Seventh Generation Principal, a way of long-term thinking that considered how every decision would affect their descendants seven generations into the future. In Japan, Buddhist monks devoted part of their daily rituals and work to ensuring the longevity of their communities, even planting and tending to bamboo forests, which would eventually be harvested, treated and used to repair temple roofs many decades hence. With each new generation, we live life faster than our ancestors. As a result, we spend less time thinking about the farther future of humanity.

We now have our sights set on colonizing Mars, mining asteroids for research and commerce, and venturing out to the furthest reaches of our galaxy. Space is no longer the final frontier; we’re already exploring it. Our current approach is about getting there, rather than considering what “getting there” could mean for future generations of humans, not to mention other life in the universe.

Where all that junk winds up isn’t something we can predict accurately. We could be unintentionally wreaking havoc on civilizations far away from Earth, catalyzing future intergalactic wars. Or, we might cause far less scintillating problems. Space junk could start to behave in unpredictable ways, reflecting sunlight the wrong direction, or changing our atmosphere, or impacting the universe in ways that don’t fit into our current understanding of physics.

Last week—30 years after my friends and I created an imaginary net to capture space debris—SpaceX launched RemoveDEBRIS, its own prototype, an experimental net to collect junk in orbit. It’s a neat idea, but even as middle schoolers, we knew it was an impractical one. Individual nets can’t possibly scale to address the hundreds of millions of particles of debris already in orbit.

The challenge is that all of our space agencies are inextricably tied to national governments and militaries. Seeking a global agreement on how to mitigate debris would involve each country divulging exactly what it was launching and when—an unlikely scenario. The private sector could collaborate to build grand-scale orbital cleaners, but their commercial interests are driven by immediate launches. Given all the planned launches in our near future, we don’t have much time to wait. We must learn to be better stewards of our own planet—and commit to very long-term thinking—before we try to colonize any others.

#### Independently, debris causes great power war.

Orwig 16 [(Jessica, senior editor at Insider. She has a Master of Science in science and technology journalism from Texas A&M University and a Bachelor of Science in astronomy and physics from The Ohio State University.) “Russia says a growing problem in space could be enough to spark a war,” January 26, 2016, https://www.businessinsider.com/russia-says-space-junk-could-spark-war-2016-1] TDI

NASA has already warned that the large amount of space junk around our planet is growing beyond our control, but now a team of Russian scientists has cited another potentially unforeseen consequence of that debris: War. Scientists estimate that anywhere from 500,000 to 600,000 pieces of human-made space debris between 0.4 and 4 inches in size are currently orbiting the Earth and traveling at speeds over 17,000 miles per hour. NEWSLETTER Sign up for the Insider Healthcare newsletter for the latest healthcare news and analysis delivered straight to your inbox. Email address Email address By clicking ‘Sign up’, you agree to receive marketing emails from Insider as well as other partner offers and accept our Terms of Service and Privacy Policy. If one of those pieces smashed into a military satellite it "may provoke political or even armed conflict between space-faring nations," Vitaly Adushkin, a researcher for the Institute of Geosphere Dynamics at the Russian Academy of Sciences, reported in a paper set to be published in the peer-reviewed journal Acta Astronautica, which is sponsored by the International Academy of Astronautics. Say, for example, that a satellite was destroyed or significantly damaged in orbit — something that a 4-inch hunk of space junk could easily do traveling at speeds of 17,500 miles per hour, Adushkin reported. (Even smaller pieces no bigger than size of a pea could cause enough damage to the satellite that it would no longer operate correctly, he notes.) It would be difficult for anyone to determine whether the event was accidental or deliberate. This lack of immediate proof could lead to false accusations, heated arguments and, eventually, war, according to Adushkin and his colleagues. A politically dangerous dilemma space junk ESA - D.Ducros In the report, the Adushkin said that there have already been repeated "sudden failures" of military spacecraft in the last two decades that cannot be explained. "So, there are two possible explanations," he wrote. The first is "unregistered collisions with space objects." The second is "machinations" [deliberate action] of the space adversary. "This is a politically dangerous dilemma," he added. But these mysterious failures in the past aren't what concerns Adushkin most. It's a future threat of what experts call the cascade effect that has Adushkin and other scientists around the world extremely concerned. The Kessler Syndrome space debris 2 leo David.Shikomba on Wikipedia In 1978, American astrophysicist Donald Kessler predicted that the amount of space debris around Earth would begin to grow exponentially after the turn of the millennium. Kessler 's predictions rely on the fact that over time, space junk accumulates. We leave most of our defunct satellites in space, and when meteors and other man-made space debris slam into them, you get a cascade of debris. The cascade effect — also known as the Kessler Syndrome — refers to a critical point wherein the density of space junk grows so large that a single collision could set off a domino effect of increasingly more collisions. For Kessler, this is a problem because it would "create small debris faster than it can be removed," Kessler said last year. And this cloud of junk could eventually make missions to space too dangerous. For Adushkin, this would exacerbate the issue of identifying what, or who, could be behind broken satellites. The future satellite Facebook Developers/YouTube So far, the US and Russian Space Surveillance Systems have catalogued 170,000 pieces of large space debris (between 4 and 8 inches wide) and are currently tracking them to prevent anymore dilemmas like the ones Adushkin and his colleagues cite in their paper. But it's not just the large objects that concern Adushkin, who reported that even small objects (less than 1/3 of an inch) could damage satellites to the point they can't function properly. Using mathematical models, Adushkin and his colleagues calculated what the situtation will be like in 200 years if we continue to leave satellites in space and make no effort to clean up the mess. They estimate we'll have: 1.5 times more fragments greater than 8 inches across 3.2 times more fragments between 4 and 8 inches across 13-20 times more smaller-sized fragments less than 4 inches across "The number of small-size, non-catalogued objects will grow exponentially in mutual collisions," the researchers reported.