### 1

#### Counterplan text: the member nations of the World Trade Organization should implement and fund a Health Impact Fund as per the Hollis and Pogge 08 card

#### The Health Impact Fund would guarantee patent rights and increase profits, while also equalizing the cost of medicines

Hollis & Pogge ’08 - Aidan Hollis [Associate Professor of Economics, the University of Calgary] and Thomas Pogge [Leitner Professor of Philosophy and International Affairs, Yale University], “The Health Impact Fund Making New Medicines Accessible for All,” *Incentives for Global Health* (2008) AT

We propose the Health Impact Fund as the most sensible solution that comprehensively addresses the problems. Financed by governments, the HIF would offer patentees the option to forgo monopoly pricing in exchange for a reward based on the global health impact of their new medicine. By registering a patented medicine with the HIF, a company would agree to sell it globally at cost. In exchange, the company would receive, for a fixed time, payments based on the product’s assessed global health impact. The arrangement would be optional and it wouldn’t diminish patent rights.¶ The HIF has the potential to be an institution that benefits everyone: patients, rich and poor alike, along with their caregivers; pharmaceutical companies and their shareholders; and taxpayers.¶ HOW THE HEALTH IMPACT FUND WORKS FOR PATIENTS¶ The HIF increases the incentives to invest in developing medicines that have high health impact. It directs research toward the medicines that can do the most good. It can also reward the development of new products, and the discovery of new uses for existing products, which the patent system alone can’t stimulate because of inadequate protection from imitation. All patients, rich and poor, would benefit from refocusing the innovation and marketing priorities of pharmaceutical companies toward health impact.¶ Any new medicines and new uses of existing medicines registered for health impact rewards would be available everywhere at marginal cost from the start. Many patients – especially in poor countries, but increasingly in wealthy ones too – are unable to afford the best treatment because it is too expensive. Even if fully insured, patients oft en lack access to medicines because their insurer deems them too expensive to reimburse. The HIF simply and directly solves this problem for registered drugs by setting their prices at marginal cost.¶ HOW THE HEALTH IMPACT FUND WORKS FOR PHARMACEUTICAL COMPANIES¶ Most proposals for increasing access to medicines would reduce the profits of pharmaceutical companies and hence their ability to fund research. The HIF, however, leaves the existing options of pharmaceutical firms untouched. It merely gives them the opportunity to make additional profits by developing new high-impact medicines that would be unprofitable or less profitable under monopoly pricing. Selling such registered medicines at cost, firms won’t be forced to defend a policy of charging high prices to poor people and they won’t be pressured to make charitable donations. With HIF-registered medicines they can instead “do well by doing good”: bring real benefit to patients in a profitable way. Research scientists of these firms will be encouraged to focus on addressing the most important diseases, not merely those that can support high prices.¶ HOW THE HEALTH IMPACT FUND WORKS FOR TAXPAYERS¶ The HIF will be supported mainly by governments, which are supported by the taxes they collect. Taxpayers want value for their money, and the HIF provides exactly that. Because the HIF is a more efficient way of incentivizing the pharmaceutical R&D we all want, total expenditures on medicines need not increase. However, if they do, the reason is that new medicines that would not have existed without the HIF are being developed. The HIF mechanism is designed to ensure that taxpayers always obtain value for money in the sense that any product regis-tered with the HIF will have a lower cost for a given amount of health impact than products outside the HIF. Taxpayers may also benefit from a reduction in risks of pandemics and other health problems that easily cross national borders.

In the squo, pharmaceutical companies have no incentive to ensure drugs are distributed and used properly. HIF incentivizes them to ensure rational use and positive health outcomes.

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As highlighted throughout this book, one main barrier to access to available drugs is price. When manufacturers’ prices are lower, then the prices consumers are charged through both public and private distribution systems will also be lower. Affordable manufacturers’ prices are therefore crucial to improved access. But manufacturers’ prices are not the sole determinant of the cost to the consumer. Import duties, port clearage charges, inspection fees, pharmacy board fees, central and regional government taxes, storage and transportation costs, and wholesale and retail markups add substantially to the manufacturers’ price.1 These supplementary costs are not always passed on to the consumer in their entirety, since the state or the nonprofi t sector may provide subsidies to consumers. But in this case the financial burdens placed on the state or the nonprofi t sector are increased by high prices. Even where supplementary costs are only partially passed on to consumers, they can significantly aff ect the aff ordability of essential medicines. Price, while crucial, is not the only determinant of access. In many low-income countries, weak health infrastructure signifi cantly limits the extent to which essential drugs are accessible. For example, Ministries of Health are often reluctant to distribute drugs to hospitals and health clinics if they believe these facilities lack the trained and motivated medical staff or the physical assets needed to ensure that the drugs are properly stored, prescribed and dispensed**.2 Alternatively, a** Ministry of Health’s administrative systems may be such that it is not able to manage the efficient distribution of the drugs that are available to it, resulting in shortages, particularly in less accessible parts of the country. Weaknesses in transportation systems and drug management practices can also result in spoilage, thereby compromising the quality of available drugs.3 On the demand side, weak infrastructure oft en imposes significant costs and time burdens on poor people in need of health treatment. For example, patients may have long distances to travel, and in many countries, “informal payments” or bribes are required to obtain access to subsidized medicines (Lewis, 2007). The second main element of the last mile problem is the failure to use correctly the drugs to which patients do have access. The WHO estimates that worldwide 50 percent of all medicines are prescribed, dispensed, or sold incorrectly, and that about half of all patients do not take medicines as directed (WHO 2004b, 75). This incorrect use exacts a huge toll in increased morbidity and mortality, in addition to the toll exacted by lack of access. Estimates suggest that between 60 and 90 percent of household health expenditure in developing countries is on medicines (DFID 2006, 1). Poor prescribing and dispensing practices, and weak adherence by patients to treatment requirements, means that much of this spending brings little in the way of health benefits. It can actually be harmful, increasing the likelihood that certain diseases will develop resistance to the drugs that are used to treat them.5 These problems occur not only in developing, but also developed countries. Common types of incorrect medicine use include (WHO 2004b, 76): • use of too many types of medicines per patient (polypharmacy); • prescription of antimicrobials in inadequate dosage or for inadequate periods or the prescription of antibiotics for non-bacterial infections (the WHO estimates that around two-thirds of all antibiotics worldwide are sold without prescription); • use of injections where oral formulations would be better, increasing the transmission of hepatitis, HIV/AIDS and other blood-borne diseases; • failure to prescribe in accordance with clinical guidelines (survey data show that between 1990 and 2004 only around 40 percent of primary care level patients in Africa, Asia, and Latin America were treated in accordance with clinical guidelines for a number of common conditions, with no improvement over this period; WHO 2006c, 2); and • inappropriate self-medication, oft en of prescription-only drugs. A key cause of incorrect use is the lack of suitably qualifi ed medical personnel available to developing country health systems. Recent fi gures show that the number of health workers per 1,000 people was only 2.3 in Africa and 4.3 in South & East Asia, compared to 18.9 and 24.8 in Europe and the Americas respectively.6 Moreover, many developing-country health workers are poorly trained and paid and are not given adequate administrative support. This in turn contributes to low morale and a high incidence of absenteeism. This problem is especially acute in rural and remote areas. Health facilities that are understaffed or staffed by inadequately trained or motivated workers are very poorly placed to meet the requirements of rational drug use (Das, Hammer, and Leonard 2008). The WHO estimates that 57 countries suffer critical shortfalls of doctors, nurses, and midwives that prevent these countries from meeting even the most basic standards of health care (WHO 2006d, 5, 11–12). This human-resource crisis is complicated by the fact that in many low-income countries staff salaries take up an inordinately large share of the health budget, leaving insufficient funds for non-staff requirements such as vaccines, essential drugs, diagnostic tools and infrastructure maintenance. Public sector health payrolls are oft en poorly administered, and phenomena such as so-called ghost workers (people who are on payrolls but do not provide the relevant services) result in significant inefficiencies. Resource-constrained countries are confronted with the need to reduce the share of the wage bill in their health budgets while increasing the number and quality of health professionals, particularly in poorer areas. In many cases, greater efficiency in the use of existing resources, while necessary, will not be sufficient to remedy these problems entirely. There is no escaping the need for significantly larger amounts of resources to be made available to developing country health sectors.7 While public sector and not-for-profit private providers are key parts of the health sector in most low-income countries, the for-profit private sector— particularly in the form of private drug outlets—is often the first point of call for large parts of the populations of these countries when they fall sick. In Cambodia, for example, it is estimated that more than 70 percent of the population first approach private drug sellers when they fall sick, and that 75 percent of legal antimalarials are sold through the private sector. In Senegal, four private wholesalers linked to pharmacies and chemists represent nearly 65 percent of all sales of antimalarials (Institute of Medicine 2004, 40–41).8 Worldwide, an increasing share of health care is being delivered through the private sector (WHO 2006c, 4). Especially in low-income countries, governments often regulate private-sector drug outlets poorly. Even where suitable regulations and licensing procedures exist, the supervisory and enforcement support needed to ensure compliance is often lacking. Coupled with poor training of staff in private drug outlets, these regulatory, supervisory and enforcement shortcomings result in poor diagnosis and dispensing practices, and subsequently in the sale of unnecessary or contra-indicated drugs or incomplete courses of medication. This wastes resources, compromises successful treatment, and can lead to adverse patient reactions and the development of drug-resistant disease forms. The incentives that private sellers have to maximize sales regardless of clinical requirements add to the likelihood of incorrect use. These incentives are present not only in the private sector, but apply where the prescribing and dispensing functions are combined, as is sometimes the case in some public health facilities in low-income countries. Th is point notwithstanding, survey data available to the WHO show that, in developing and transition countries, the use of medicines is signifi - cantly worse in the private than in the public sector (WHO 2006c, 4).9 Even where drugs are correctly prescribed, they are often sold in inappropriate packaging, with inadequate instructions for patient use, or both. Th is creates serious problems when patients are illiterate or ill-informed about the implications of not taking medication as directed. Th is is particularly problematic with respect to medicines whose partial completion is oft en suffi cient to relieve symptoms. The result is a serious problem with patient adherence to the requirements of their drug treatment. Drug prices are also a factor in lack of patient adherence to treatment regimens. Poor patients may purchase insufficient amounts of the medicine, in an attempt to economize. A 2006 WHO report suggests that, unless effective action is taken, the problem of incorrect drug use is likely to get worse. This is so for two reasons. First, an increasing share of health care worldwide is being provided through the private sector. In developing countries and countries in transition to a market economy, provision through the private sector is likely to result in a higher incidence of incorrect drug use than provision through the public sector, which is important given the prominence of private drug sellers as a first point of call. Second, many large-scale initiatives to treat diseases of major public health importance, such as malaria, HIV/ AIDS, and tuberculosis, concentrate primarily on access and give insufficient attention to the problem of irrational use (WHO 2006c, 4). Irrational use also occurs in developed countries. As Avorn (2004) notes, there is a paucity of reliable clinical trials comparing the risks and benefits of different medicines, and at the same time, pharmaceutical companies’ marketing muscle sometimes leads to poor prescribing choices by clinicians. Under present arrangements, pharmaceutical companies have little incentive to do anything about the last mile problem, particularly in poor countries where this problem is most acute. Typically drug manufacturers sell their products to public health authorities or private wholesalers well removed from consumers of the product, and do so at a price designed to maximize profits.10 Nonprice factors associated with the accessibility of their product and issues relating to its correct prescription and use are matters that manufacturers have little incentive to address, for two interrelated reasons. First, these problems are complex and difficult to address in many developing countries. And, second, the financial gains pharmaceutical companies might reap from helping to resolve such problems—higher sales volumes flowing from wider accessibility and better outcomes—are, under current remuneration arrangements, uncertain and likely to be small. (In fact, correct and effective use of a medicine may reduce demand for it). It might be argued that pharmaceutical companies should not be given a role in tackling the last mile problem because they are ill-equipped to deal with it, especially with respect to issues such as systemic problems in the health systems of low-income countries. Th at pharmaceutical companies are poorly equipped to deal with such issues is true but unsurprising, given the lack of incentives that they currently have to address them. The important question is whether such companies could help solve the last mile problem if they were provided with a very different set of incentives. Rewarding pharmaceutical companies on the basis of their product’s health impact changes their relationship to the last mile problem in a fundamental way. Far from having no interest in this problem, Health Impact Fund registrants would have a strong incentive to address it, since their profi ts are based on their product’s health impact. How will companies respond to the last mile problem with respect to the drugs they have registered with the HIF? Consider first lack of access due to unaffordability. As detailed elsewhere in this book, HIF registrants will be required to sell their product worldwide within a price window ranging between the average and marginal cost of production and distribution as determined by the HIF. Furthermore, registrants will have strong incentives to try to reduce wholesale and retail mark-ups on their products, and to use their lobbying power with politicians to ensure that taxes and other government charges are kept to a minimum. It is therefore reasonable to expect that the retail prices of HIF-rewarded medicines will be within the reach of a very large proportion of those who need them. The incentives of suppliers of HIF-registered medicines are quite different from those of suppliers of patented medicines outside the HIF. HIF registered drugs sell at very low prices and are more likely to have many highly price-sensitive customers. A small addition to the retail price can deter a large number of patients at a significant cost to the registrant in terms of reduced payments from the HIF. Thus, retail mark-ups and taxes, which both increase the price to the patient, may substantially reduce the registrant’s profits. As a result, HIF registrants will be strongly motivated to lobby for reduced taxes and also to monitor and try to restrict retail mark-ups. Th ese incentives are much weaker for suppliers of patented medicines not registered with the HIF. Such medicines sell at much higher prices, where variations in mark-ups and taxes typically have smaller eff ects on the number of patients buying the product. And their suppliers will therefore not be as interested in controlling mark-ups and taxes. What about lack of access caused by nonprice factors? Take the case where a country’s health ministry is unwilling to purchase a particular drug, or willing to purchase it only in relatively small amounts, because it considers that the necessary medical and logistical support to administer the drug effectively does not exist in parts of the health system, or because the ministry’s drug distribution system is not up to the task of distributing the drug effectively. How would the HIF registrant respond? At present, developing country governments, supported by aid donors, are directing large amounts of time and money to strengthening public health systems, including procurement and distribution systems. Much of this work is being done through so-called Sector Wide Approaches (SWAps) and similar sector-focused programs, in which donors work with governments to develop a comprehensive health-sector budget, providing a framework within which government and donor funds are prioritized, disbursed, and ac counted for. If systemic shortcomings in the health sector were adversely affecting the widespread accessibility of its HIF-registered drug, a pharmaceutical company might well be prepared to provide financial and other support to a SWAp designed to address these problems, though the company would understandably be focused on issues relating to the distribution of its own product. It should be emphasized that the kind of support here envisaged would in no way represent the outsourcing of responsibility for a country’s health system to pharmaceutical companies. Clearly, governments should take primary responsibility for public health systems. But just as bilateral and multilateral aid donors can participate in SWAps without absolving home governments of their responsibilities, private companies could play a constructive supporting role as well. It might be objected that pharmaceutical companies with substantial resources at their disposal and with big financial rewards at stake might skew the implementation of a SWAp in their own favor, potentially undermining the process of priority setting which the SWAp is designed to facilitate. Such dangers would doubtless exist, but the composition of a SWAp, which normally includes a number of major donors as well as the home government, would act as a strong countervailing force. Th e involvement in a SWAp of a commercial company with a specifi c and relatively narrow area of interest might also bring significant advantages. SWAps and similar initiatives are sometimes criticized on the grounds that, insofar as they involve cooperation between a several agencies directed at the achievement of broadly-specified goals, they lack the individualized accountability needed for success. It is a short step, the argument goes, from everyone being responsible for everything to no one being responsible for anything at all (Birdsall 2007, 2; Easterly 2006, 14–15). A pharmaceutical company continually questioning how the work being undertaken through the SWAp is overcoming obstacles to the competent use of its drug—obstacles that are likely to be endemic and therefore relevant to essential medicines generally—could play a constructive role in keeping SWAp members focused on the need to undertake rigorous priority-setting for health-sector expenditure and to support this with practical, solution-oriented programs. Insofar as the HIF, by tying reward to health impact, aligns the financial interests of HIF-rewarded companies and the health interests of relevant population groups, such companies could strengthen the accountability of the health system to patients by forcefully representing their interests within SWAps and similar programs. While SWAps are designed to incorporate all major players in the health sector, they typically are more representative of the public than the private sector. Th ey rarely include private for-profi t drug retailers, for example, even though these outlets often play a major role in the distribution and sale of vital drugs in low-income countries. Manufacturers of HIF-rewarded drugs would therefore have strong incentives to ensure that private distribution systems were as effi cient as possible in getting their drugs to private outlets. In addition, the incentives that companies would have to ensure good handling, diagnostic, dispensing, and labeling practices in relation to their drugs would in turn lead them to support improved public regulatory and supervisory systems, because the alternative of developing and running alternative systems themselves, or contracting them out to private sector agencies, would not be cost-eff ective. In other words, HIF registrants would be motivated to support the development of an eff ective public regulatory system. Th e following section discusses in greater detail the incentives that drug manufacturers would have to address rational use issues. Rewarding pharmaceutical companies on the basis of the health impact of their products clearly gives these companies a pressing interest in how their drugs are actually used. In order to promote a drug’s health impact, a company will want all those who need the drug to have timely access to it in the right amounts, will want the quality of the drug to be good, and will want the drug to be used properly by patients. HIF registrants would have strong incentives to work toward achieving these conditions. Th ere are a variety of measures that are being or could be taken through the public sector to encourage rational use of essential drugs. Th ese include:11 • the establishment of a national body to develop an essential medicines use policy; • the development of a national essential medicines list; • the preparation of clinical guidelines for treatment of specific diseases; • the preparation of standard operating procedures to govern pharmaceutical management tasks relating to specific drug treatments; • the establishment of drug and therapeutics committees in hospitals and health clinics; • continuing in-service medical education; • strengthening regulation, supervision, audit and feedback mechanisms, including pharmacovigilance systems; • improving public education about medicines and their use; and • providing sufficient funds to facilitate the availability of medicines and suitably qualifi ed and motivated staff . While several countries have implemented or are implementing some of these policies, data from the period between 1999 and 2003 shows that a signifi - cant number of countries fail to make use of many of the options available to them. Of member states reporting to the WHO: less than 60% had monitored the use of medicines in the previous two years; about 50% had undertaken a public-education program on use of medicines in the previous two years; about 40% supported independent, continuing medical education for prescribers and had established a medicines information centre; 30% to 40% had drug and therapeutic committees in most hospitals and regions; in about 60% clinical guidelines had been updated in the previous fi ve years; just over 70% had a national essential medicines list but only 30% used this list for insurance reimbursement; and only 60% to 70% trained their prescribers in the essential medicines concept, pharmacotherapy, rational prescribing and the application of clinical guidelines. (WHO 2006c, 4) While these measures are of broad scope, and have impacts beyond the distribution and use of any particular drug, a HIF registrant might support one or more of them directly or use its influence to advocate for their introduction or expansion by relevant governments. We have already suggested that a strengthened regulatory and supervisory system is something that would interest an HIF registrant, and a pharmaceutical company may well be able to mobilize the resources needed to make a significant difference to the reach and performance of these systems. Registrants might also be willing and able to provide financial resources—which in other circumstances might be directed to marketing—to improve the pay and conditions of health workers in those areas of the system that suff er from acute human resource shortages, to improve pre-service or in-service training of frontline health care workers, or both, to the extent that such expenses supported the increase in the use of their products leading to higher payments from the HIF.12 Registrants might fi nd it attractive to provide funding for consumer education campaigns. It is worth considering that pharmaceutical manufacturers provide services to encourage rational use in developed countries, because the high prices they charge make it worthwhile for them to do so. Th ey have large numbers of sales representatives whose job it is to provide clinicians with relevant information on their products. They support pharmacies in providing supplementary information to patients, and they engage in very expensive patient education campaigns. To be sure, much of the current marketing to doctors and patients is designed not so much to inform as to persuade (this is especially true when competing fi rms off er similar products in a given therapeutic class). However, some current marketing is informative and valuable. Because the HIF is designed to provide large rewards only to first-in-class medicines, with small rewards for follow-on products, the extent of competitive marketing is likely to be small, but fi rms will still have incentives to engage in informative promotional activities. Promotional activities by pharmaceutical fi rms to doctors and patients have been widely criticized. Firms whose only reward is a high price, regardless of the therapeutic outcome, have an incentive to encourage as much use as possible of their product, and this had led to promotional spending that has not been useful and may even have been harmful to patients. Whether a drug is actually indicated for a patient does not affect the profit earned by a monopolist. It should be recognized that the incentives for HIF registrants will be somewhat different from those of nonregistrants in two significant ways. First, the HIF only offers high rewards per unit for products that have a high impact per unit. Thus, the motivation to increase sales will be strongest for those products which are really therapeutically important, not those with the highest price. The incentive to sell products that are less therapeutically eff ective than older alternatives will be very low, since the HIF payments for such products will also be very low. Second, the HIF will assess health impact, including how the product is used in practice. If sampling of prescribing practice—whether through private drug retailers or government clinics—shows that the drug is being sold inappropriately, the HIF will take that into account in determining the health impact of the medicine, and the assessed health impact will fall, rather than rise, because of such sales. To be sure, the HIF will not be able to measure health impact perfectly, and there will evidently be challenges as fi rms attempt to expand sales volumes inappropriately. But overall it is important to recognize that some of the less attractive outcomes of pharmaceutical promotion will be avoided for HIF-registered drugs because the reward is based on health impact, not simply on price times volume. Th ese benefits of better-aligned incentives with respect to pharmaceutical promotion apply equally to developing and developed countries.

### 2

#### The member nations of the World Trade Organization ought to reform intellectual property protections for medicines using the mechanisms described by MSF ’17.

#### We allow secondary patents, but only under stricter patentability requirements, which solves innovation and high drug prices. MSF 17:

MSF ’17 – Médecins Sans Frontières [Doctors Without Borders - Médecins Sans Frontières (MSF) is an international, independent, medical humanitarian organisation that delivers emergency aid to people affected by armed conflict, epidemics, healthcare exclusion and natural or man-made disasters.], “A Fair Shot for Vaccine Affordability: Understanding and addressing the effects of patents on access to newer vaccines,” September, 2017. Accessed Aug. 12, 2021. <<https://msfaccess.org/sites/default/files/2018-06/VAC_report_A%20Fair%20Shot%20for%20Vaccine%20Affordability_ENG_2017.pdf>> AT

Countries can take a variety of steps to promote competition in vaccine manufacturing and help mitigate the complex patent thickets that could block, delay or increase uncertainties around access to multiple sources of vaccines. Governments should adopt public health-oriented IP policies, making full use of TRIPS flexibilities in both substantive and procedural aspects of national patent laws. Countries should:

• Encourage and accelerate follow-on development and competition of vaccines and vaccine technologies through the introduction and use of broad Bolar exemptions. This will support an early start for research and clinical studies by follow-on manufacturers, and support independent follow-on research and development.

• Apply strict patentability criteria for vaccine and vaccine technologies in patent examination and judicial proceedings. Countries should closely scrutinise patent applications concerning common methods of treatment, dosage forms and claims concerning specific age groups. Countries should reject trivial changes to known vaccine technologies, or composition patent applications that merely present the assembly of more ingredients using a known technology.

• Implement robust pre- and post-grant opposition procedures in national patent law systems that allow greater public scrutiny and opportunities to challenge unmerited patent applications from an early stage. Procedures that allow third-party observation but lack a mandatory hearing requirement could be improved to provide better transparency and accountability to the public.

• Improve use of compulsory licencing. Governments should strengthen the mechanisms of issuing compulsory licences to facilitate the most expedited access to multiple sources of vaccines and to safeguard public health.

• Strengthen technical capacity to ensure patent examiners apply strict patentability criteria and screen out unmerited applications in a timely manner. This will provide clarity on the patent landscape concerning important vaccines and technologies.

• Increase transparency of patent office filings to enable third parties to better understand the IP landscape, especially through procedures to promote disclosure of non-proprietary biological qualifier names74 of vaccines. Prospective manufacturers will be able to make decisions more efficiently if they understand the IP landscape clearly. Government procurement decision making will also be improved by addressing the current information asymmetry.

• Make full use of LDCs’ exemption from mandatory patent protection to accelerate access to quality assured follow-on new vaccines and encourage competition to improve affordability of vaccines.

• Demand that international organisations like WHO, Gavi, the Pan American Health Organization (PAHO) and the United Nations Children’s Fund (UNICEF) improve technical support for countries to: identify legal barriers, use flexibilities under IP laws and improve transparency of patent information to facilitate follow-on development and foster robust competition for new vaccines.75

### 3

#### The pharma industry is strong now but patents are key for continued economic growth. Batell and PhRMA 14:

Batell and PhRMA {Battelle is the world’s largest nonprofit independent research and development organization, providing innovative solutions to the world’s most pressing needs through its four global businesses: Laboratory Management, National Security, Energy, Environment and Material Sciences, and Health and Life Sciences. The Pharmaceutical Research and Manufacturers of America (PhRMA) represents the country’s leading pharmaceutical research and biotechnology companies, which are devoted to inventing medicines that allow patients to live longer, healthier, and more productive lives.}, 14 – “The U.S. Biopharmaceutical Industry: Perspectives on Future Growth and The Factors That Will Drive It,” http://phrma-docs.phrma.org/sites/default/files/pdf/2014-economic-futures-report.pdf//marlborough-wr//

Compared to other capital-intensive, advanced manufacturing industries in the U.S., the biopharmaceutical industry is a leader in R&D investment, IP generation, venture capital investment, and R&D employment. Policies and infrastructure that helped foster these innovative activities have allowed the U.S. to seize global leadership in biopharmaceutical R&D over the past 30 years. However, as this report details, other countries are seeking to compete with the U.S. by borrowing and building upon some of these pro-innovation policies to improve their own operating environment and become more favorable to biopharmaceutical companies making decisions about where to locate their R&D and manufacturing activities. A unique contribution of this report was the inclusion of the perspective of senior-level strategic planning executives of biopharmaceutical companies regarding what policy areas they see as most likely to impact the favorability of the U.S. business operating environment. The executives cited the following factors as having the most impact on the favorability of the operating environment and hence, potential growth of the innovative biopharmaceutical industry in the U.S.: • Coverage and payment policies that support and encourage medical innovation • A well-functioning, science-based regulatory system • Strong IP protection and enforcement in the U.S. and abroad The top sub-attribute identified as driving future biopharmaceutical industry growth in the U.S. cited by executives was a domestic IP system that provides adequate patent rights and data protection. Collectively, these factors underscore the need to reduce uncertainties and ensure adequate incentives for the lengthy, costly, and risky R&D investments necessary to develop new treatments needed by patients and society to address our most costly and challenging diseases. With more than 300,000 jobs at stake between the two scenarios, the continued growth and leadership of the U.S. innovative biopharmaceutical industry cannot be taken for granted. Continued innovation is fundamental to U.S. economic well-being and the nation’s ability to compete effectively in a globalized economy and to take advantage of the expected growth in demand for new medicines around the world. Just as other countries have drawn lessons from the growth of the U.S. biopharmaceutical sector, the U.S. needs to assess how it can improve the environment for innovation and continue to boost job creation by increasing R&D investment, fostering a robust talent pool, enhancing economic growth and sustainability, and continuing to bring new medicines to patients.

#### Secondary patents in particular are key to generating new treatments to medicines based on existing medicines. Evergreening does not stop production of generic versions of the orginial formulation

Christopher M. Holman, [senior scholar C-IP2] 18 - ("Why Follow-On Pharmaceutical Innovations Should Be Eligible For Patent Protection," Intellectual Property Watch, 9-21-2018, accessed 9-18-2021, https://www.ip-watch.org/2018/09/21/follow-pharmaceutical-innovations-eligible-patent-protection/)//ML

Why Protect Follow-On Innovation?¶ The attack on secondary pharmaceutical patents is based in part on the flawed premise that follow-on innovation is of marginal value at best, and thus less deserving of protection than the primary inventive act of identifying and validating a new drug active ingredient. In fact, follow-on innovation can play a critical role in transforming an interesting drug candidate into a safe and effective treatment option for patients. A good example can be seen in the case of AZT (zidovudine), a drug ironically described in the Guidelines as the “first breakthrough in AIDS therapy.” AZT began its life as a failed attempt at a cancer drug, and it was only years later that its potential application in the fight against AIDS was realized. Follow-on research resulted in a method-of-use patent directed towards the use of AZT in the treatment of AIDS, and it was this patent that incentivized the investment necessary to bridge the gap between a promising drug candidate and a safe, effective, and FDA-approved pharmaceutical. Significantly, because of the long lag time between the first public disclosure of AZT and the discovery of its use in the treatment of AIDS, patent protection for the molecule per se was unavailable. In a world where follow-on innovation is unpatentable, there would have been no patent incentive to invest in the development of the drug, and without that incentive AZT might have languished on the shelf as simply one more failed drug candidate.¶ Other examples of important drugs that likely never would have been made available to patients without the availability of a “secondary” patent include Evista (raloxifene, used in the treatment of osteoporosis and to reduce the risk of invasive breast cancer), Zyprexa (olanzapine, used in the treatment of schizophrenia), and an orally-administrable formulation of the antibiotic cefuroxime.¶ Pharmaceutical development is prolonged and unpredictable, and frequently a safe and effective drug occurs only as a result of follow-on innovation occurring long after the initial synthesis and characterization of a pharmaceutically interesting chemical compound. The inventions protected by secondary patents can be just as critical to the development of drugs as a patent on the active ingredient itself.¶ The Benefits of Follow-On Innovation The criticism of patents on follow-on pharmaceutical innovation rests on an assumption that follow-on innovation provides little if any benefit to patients, and merely serves as a pretense for extending patent protection on an existing drug. In fact, there are many examples of follow-on products that represent significant improvements in the safety-efficacy profile. For example, the original formulation of Lumigan (used to treat glaucoma) had an unfortunate tendency to cause severe hyperemia (i.e., redeye), and this adverse event often lead patients to stop using the drug, at times resulting in blindness. Subsequent research led to a new formulation which largely alleviated the problem of hyperemia, an example of the type of follow-on innovation that significantly benefits patients but that which would be discouraged by a patent regime that does not reward follow-on innovation.¶ Follow-on pharmaceutical innovation can come in the form of an extended-release formulation that permits the drug to be administered at less frequent intervals than the original formulation. Critics of secondary patents downplay the significance of extended-release formulations, claiming that they represent nothing more than a ploy to extend patent protection without providing any real benefit to patients. In fact, the availability of a drug that can be taken once a day has been shown to improve patient compliance, a significant issue with many drugs, particularly in the case of drugs taken by patients with dementia or other cognitive impairments. Extended-release formulations can also provide a more consistent dosing throughout the day, avoiding the peaks and valleys in blood levels experienced by patients forced to take an immediate-release drug multiple times a day.¶ Other examples of improved formulations that provide real benefits to patients are orally administrable formulations of drugs that could previously only be administered by more invasive intravenous or intramuscular injection, combination products that combine two or more active pharmaceutical agents in a single formulation (resulting in improved patient compliance), and a heat-stable formulation of a lifesaving drug used to treat HIV infection and AIDS (an important characteristic for use in developing countries with a hot climate).¶ “Evergreening” – an Incoherent Concept¶ Drug innovators are often accused of using secondary patents to “evergreen” the patent protection of existing drugs, based on an assumption that a secondary patent somehow extends the patent protection of a drug after the primary patent on the active ingredient is expired. As a general matter, this is a false assumption — a patent on an improved formulation, for example, is limited to that improvement and does not extend patent protection for the original formulation.¶ Once the patents covering the original formulation have expired, generic companies are free to market a generic version of the original product, and patients willing to forgo the benefits of the improved formulation can choose to purchase the generic product, free of any constraints imposed by the patent on the improvement. Of course, drug innovators hope that doctors and their patients will see the benefits of the improved formulation and be willing to pay a premium for it, but it is important to bear in mind that ultimately it is patients, doctors, and third-party payers who determine whether the value of the improvement justifies the costs.¶ Of course, this assumes a reasonably well-functioning pharmaceutical market. If that market breaks down in a manner that forces patients to pay higher prices for a patented new version of a drug that provides little real improvement over the original formulation, then it is the deficiency in the market which should be addressed, rather than the patent system itself.¶ For example, if a drug company is found to have engaged in some anticompetitive activity to block generic competition in the market for the original product once it has gone off patent, then antitrust and competition laws should be invoked to address that problem. If doctors are prescribing an expensive new formulation of a drug that provides little benefit compared to a cheaper, unpatented original product, then that is a deficiency in the market that should be addressed directly, rather than through a broadside attack on follow-on innovation. In short, if is found that secondary patents are being used in a manner that creates an unwarranted extension of patent protection, it is that misuse of the patent system which should be addressed directly, rather than through what amounts to an attack on the patent system itself.¶

## Case

### Adv

1. Turn: repurposing old medicines for new purposes saves time and resources – mRNA research had been in the works for a long time before it was put into the COVID vaccine and now is being used for an HIV vaccine – if that tech could only be used once there would have been no incentive to repurpose it that many times, meaning
   1. We either would have no effective vaccine for those viruses or
   2. The research would have taken much longer, killing millions in the meantime
2. **Alt causes -- evergreening doesn't extend patent for the original product**

**Holman 20** [Chris Holman, Senior Fellow for Life Sciences & Senior Scholar @ Center for Intellectual Property x Innovation Policy, Professor at the University of Missouri-Kansas City School of Law. "Why Pharmaceutical Follow-On Innovation Should Be Eligible For Patent Protection", Geneva Network, 2-7-2020, accessed 9-5-2021, https://geneva-network.com/research/why-pharmaceutical-follow-on-innovation-should-be-eligible-for-patent-protection/] HWIC

Drug innovators are often accused of using secondary patents to “evergreen” the patent protection of existing drugs, based on an assumption that a secondary patent somehow extends the patent protection of a drug after the primary patent on the active ingredient is expired. As a general matter, this is a false assumption — a patent on an improved formulation, for example, is limited to that improvement and does not extend patent protection for the original formulation.

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**UQness LBL**

#### PFAD--1] 22% of new drugs being innovative is a lot 2] its not a q of percentage but actual number--even if its more old than new theres still a lot of new medicines being created

#### Arnold Ventures--evergreening may create monopolies over specific drugs but not the drug market in general--that encourages innovation of new unpatented techniques or looking into more drugs which is good and what 1AC Hotez talks about--turns case and means they have zero internal link

#### Radhakrishnan--Only warrant is “pharma companies don’t spend a lot on R&D” which 1] is not true, the ev says its 1/6 which is a ton for big companies 2] is non-unique

### UQness

#### On Sobti – drugs to prevent antibiotic resistance only work if people actually have access to them and take them on an appropriate schedule ACCORDING TO SRIVATSA – that’s the HIF CP and the last mile problem

#### Investment in pharma high, waves of innovation

Cancherini et al. 4/30 [(Laura, Engagement Manager @ McKinsey & Company, Joseph Lydon, Associate Partner @ McKinsey & Company, Jorge Santos Da Silva, Senior Partner at McKinsey & Company, and Alexandra Zemp, Partner at McKinsey & Company), “What’s ahead for biotech: Another wave or low tide?“, McKinsey & Company, 4-30-2021, https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/whats-ahead-for-biotech-another-wave-or-low-tide]

Belying this downbeat mood, biotech has in fact had one of its best years so far. By January 2021, venture capitalists had invested some 60 percent more than they had in January 2020, with more than $3 billion invested worldwide in January 2021 alone.5 IPO activity grew strongly: there were 19 more closures than in the same period in 2020, with an average of $150 million per raise, 17 percent more than in 2020. Other deals have also had a bumper start to 2021, with the average deal size reaching more than $500 million, up by more than 66 percent on the 2020 average (Exhibit 3).6 What about SPACs? The analysis above does not include special-purpose acquisition companies (SPACs), which have recently become significant in IPOs in several industries. Some biotech investors we interviewed believe that SPACs represent a route to an IPO. How SPACs will evolve remains to be seen, but biotechs may be part of their story. Fundamentals continue strong When we asked executives and investors why the biotech sector had stayed so resilient during the worst economic crisis in decades, they cited innovation as the main reason. The number of assets transitioning to clinical phases is still rising, and further waves of innovation are on the horizon, driven by the convergence of biological and technological advances. In the present day, many biotechs, along with the wider pharmaceutical industry, are taking steps to address the COVID-19 pandemic. Together, biotechs and pharma companies have more than 250 vaccine candidates in their pipelines, along with a similar number of therapeutics. What’s more, the crisis has shone a spotlight on pharma as the public seeks to understand the roadblocks involved in delivering a vaccine at speed and the measures needed to maintain safety and efficacy standards. To that extent, the world has been living through a time of mass education in science research and development. Biotech has also benefited from its innate financial resilience.

Healthcare as a whole is less dependent on economic cycles than most other industries. Biotech is an innovator, actively identifying and addressing patients’ unmet needs. In addition, biotechs’ top-line revenues have been less affected by lockdowns than is the case in most other industries. Another factor acting in the sector’s favor is that larger pharmaceutical companies still rely on biotechs as a source of innovation. With the top dozen pharma companies having more than $170 billion in excess reserves that could be available for spending on M&A, the prospects for further financing and deal making look promising. For these and other reasons, many investors regard biotech as a safe haven. One interviewee felt it had benefited from a halo effect during the pandemic. More innovation on the horizon The investors and executives we interviewed agreed that biotech innovation continues to increase in quality and quantity despite the macroeconomic environment. Evidence can be seen in the accelerating pace of assets transitioning across the development lifecycle. When we tracked the number of assets transitioning to Phase I, Phase II, and Phase III clinical trials, we found that Phase I and Phase II assets have transitioned 50 percent faster since 2018 than between 2013 and 2018, whereas Phase III assets have maintained much the same pace. There could be many reasons for this, but it is worth noting that biotechs with Phase I and Phase II assets as their lead assets have accounted for more than half of biotech IPOs. Having an early IPO gives a biotech earlier access to capital and leaves it with more scope to concentrate on science.

#### Innovation high now

Kenan 6-9, The Frank Hawkins Kenan Institute of Private Enterprise develops and promotes innovative, market-based solutions to vital economic issues. With the belief that private enterprise is the cornerstone of a prosperous and free society, the institute fosters the entrepreneurial spirit to stimulate economic prosperity and improve the lives of people in North Carolina, across the country and around the world. Kenan Institute, 6-9-21, “Turbocharging Healthcare Innovation” <https://kenaninstitute.unc.edu/kenan-insight/turbocharging-healthcare-innovation/> brett

As COVID-19 began to spread around the globe, companies and entrepreneurs stepped up to develop new technologies and redeploy existing technologies in their portfolio to tackle the disease and cope with the constraints it brought. The pandemic forced telemedicine into the mainstream and brought mRNA vaccine technology to the forefront. At the same time, new technologies such as CRISPR gene editing and artificial intelligence (AI) approaches have been finding their niche for speeding up drug discovery and development.

Healthcare innovation was already on the fast train before the pandemic. Now, it’s been turbocharged. In this Kenan Insight, we explore why the 2021 Trends in Entrepreneurship Report names emerging technology in the healthcare industry as a key trend for entrepreneurship, along with some of the challenges that come with fast-moving technology advances.

A trajectory of explosive growth

The healthcare industry has experienced extraordinary growth over the past four decades. Big pharma is driving much of this boom, accounting for 10% of the U.S. economy’s overall R&D spending at the end of 2020.1 The medical device industry, expected to generate $54.5 billion over the next four years, is another important player.2 This growth is catching the attention of investors. In 2020, health tech startups raised approximately $14 billion in venture capital funding, nearly double that of 2019.3 CB Insights estimates there are now 51 healthcare unicorns, defined as startups valued at $1 billion or more.

Health-tech venture funding reached record levels in 2020

Chart, bar chart, histogram

Description automatically generated

Source: Deloitte analysis of Rock Health’s Digital Health Funding Database

Innovation is a critical driver in the healthcare sector. Increasing rates of innovation can be seen in the sharp rise of U.S. patents granted for pharmaceuticals and medical devices in recent years. Between 2013 and 2019, more than 60,000 pharmaceutical patents and more than 125,000 medical device patents were granted.4 Today, there are more than 18,500 drugs at various stages of the development process worldwide.5

Maturing technologies

The increasing numbers of patent applications, clinical trials and collaborations are leading indicators of a vibrant and growing biopharmaceutical ecosystem. However, the proliferation of innovation tools, rather than just innovative products, is what will allow the next generation of pharmaceutical drugs to be discovered more quickly and more efficiently, to provide more effective treatments and to target diseases that have so far evaded our collective intervention efforts. As scientists learn more about human genes and their connection to diseases, these insights can feed into tools that make drug R&D faster, less expensive and more precise.

AI technology has matured to the point where it can now be used reliably to analyze huge amounts of data and solve extremely complex problems. This has made AI attractive to the pharmaceutical industry as a tool that can enable more efficient identification of new drugs and drug targets. In 2020, drug discovery was the focus area that received the most private AI investment, with more than $13.8 billion invested globally. This was 4.5 times higher than the total for 2019.6

CRISPR gene editing is another hot technology that is enabling the development of more innovative and accurate therapeutic strategies. This tool is making it easier to determine the genes and proteins that cause or prevent disease and thus to identify new targets for potential drugs. As of the second quarter of 2020, there were 724 active companies around the world focused on using or developing CRISPR technology and almost 50 clinical trials involving CRISPR.7

mRNA was certainly one of the brightest technology stars of 2020. After decades of research, mRNA proved to be the ideal solution for developing a highly effective COVID-19 vaccine at record speed. However, this is likely only the beginning of the story for mRNA. Therapies based on mRNA technology are being developed to treat malaria, cancer and multiple sclerosis and we’ll likely see more mRNA-based vaccines designed to fight a host of current and future infectious diseases. As of February 2021, CB Insights reports more than 520 ongoing clinical trials worldwide that were applying mRNA technology to more than 20 disease classes.8

#### Pharma innovation high now – monetary incentive is the biggest factor.

**Swagel 21** Phillip L. Swagel, Director of the Congressional budget office 4-xx-2021, "Research and Development in the Pharmaceutical Industry," Congressional Budget Office, <https://www.cbo.goc/publication/57126#_idTextAnchor020> SJ//DA

**Every year, the U.S. pharmaceutical industry develops a variety of new drugs that provide valuable medical benefits. Many of those drugs are expensive and contribute to rising health care costs for the private sector and the federal government. Policymakers have considered policies that would lower drug prices and reduce federal drug expenditures. Such policies would probably reduce the industry’s incentive to develop new drugs.** In this report, the Congressional Budget Office assesses trends in spending for drug research and development (R&D) and the introduction of new drugs. CBO also examines factors that determine how much drug companies spend on R&D: expected global revenues from a new drug; cost to develop a new drug; and federal policies that affect the demand for drug therapies, the supply of new drugs, or both. What Are Recent Trends in Pharmaceutical R&D and New Drug Approvals? T**he pharmaceutical industry devoted $83 billion to R&D expenditures in 2019. Those expenditures covered a variety of activities, including discovering and testing new drugs, developing incremental innovations such as product extensions, and clinical testing for safety-monitoring or marketing purposes. That amount is about 10 times what the industry spent per year in the 1980s, after adjusting for the effects of inflation.** The share of revenues that drug companies devote to R&D has also grown: **On average, pharmaceutical companies spent about one-quarter of their revenues (net of expenses and buyer rebates) on R&D expenses** in 2019, which is **almost twice as large a share of revenues as they spent in 2000.** That revenue share is larger than that for other knowledge-based industries, such as semiconductors, technology hardware, and software. The number of new drugs approved each year has also grown over the past decade. On averace, the Food and Drug Administration (FDA) approved 38 new drugs per year from 2010 through 2019 (with a peak of 59 in 2018), which is 60 percent more than the yearly average over the previous decade. **Many of the drugs that have been approved in recent years are “specialty drugs.” Specialty drugs generally treat chronic, complex, or rare conditions, and they may also require special handling or monitoring of patients**. Many specialty drugs are biologics (large-molecule drugs based on living cell lines), **which are costly to develop, hard to imitate, and frequently have high prices.** Previously, most drugs were small-molecule drugs based on chemical compounds. Even while they were under patent, those drugs had lower prices than recent specialty drugs have. Information about the kinds of drugs in current clinical trials indicates that much of the industry’s innovative activity is focused on specialty drugs that would provide new cancer therapies and treatments for nervous-system disorders, such as Alzheimer’s disease and Parkinson’s disease. **What Factors Influence Spending for R&D?** Drug companies’ R&D spending decisions depend on three main factors: Anticipated lifetime global revenues from a new drug, **Expected costs to develop a new drug**, and Policies and programs that influence the supply of and demand for prescription drugs. Various considerations inform companies’ expectations about a drug’s revenue stream, including the anticipated prices it could command in different markets around the world and the expected global sales volume at those prices (given the number of people who might use the drug). The prices and sales volumes of existing drugs provide information about consumers’ and insurance plans’ willingness to pay for drug treatments. Importantly, when drug companies set the prices of a new drug, they do so to maximize future revenues net of manufacturing and distribution costs. A drug’s sunk R&D costs—that is, the costs already incurred in developing that drug—do not influence its price. **Developing new drugs is a costly and uncertain process, and many potential drugs never make it to market. Only about 12 percent of drugs entering clinical trials are ultimately approved for introduction by the FDA. In recent studies, estimates of the average R&D cost per new drug range from less than $1 billion to more than $2 billion per drug**. Those estimates include the costs of both laboratory research and clinical trials of successful new drugs as well as expenditures on drugs that do not make it past the laboratory-development stage, that enter clinical trials but fail in those trials or are withdrawn by the drugmaker for business reasons, or that are not approved by the FDA. Those estimates also include the company’s capital costs—the value of other forgone investments—incurred during the R&D process. Such costs can make up a substantial share of the average total cost of developing a new drug. The development process often takes a decade or more, and during that time the company does not receive a financial return on its investment in developing that drug. The federal government affects R&D decisions in three ways. First, it increases demand for prescription drugs, which encourages new drug development, by fully or partially subsidizing the purchase of prescription drugs through a variety of federal programs (including Medicare and Medicaid) and by providing tax preferences for employment-based health insurance. Second, the federal government increases the supply of new drugs. It funds basic biomedical research that provides a scientific foundation for the development of new drugs by private industry. Additionally, tax credits—both those available to all types of companies and those available to drug companies for developing treatmentscof uncommon diseases—provide incentives to invest in R&D. Similarly, deductions for R&D investment can be used to reduce tax liabilities immediately rather than over the life of that investment. Finally, the patent system and certain statutory provisions that delay FDA approval of generic drugs provide pharmaceutical companies with a period of market exclusivity, when competition is legally restricted. During that time, they can maintain higher prices on a patented product than they otherwise could, which makes new drugs more profitable and thereby increases drug companies’ incentives to invest in R&D. Third, some federal policies affect the number of new drugs by influencing both demand and supply. For example, federal recommendations for specific vaccines increase the demand for those vaccines and provide an incentive for drug companies to develop new ones. Additionally, federal regulatory policies that influence returns on drug R&D can bring about increases or decreases in both the supply of and demand for new drugs. Trends in R&D Spending and New Drug Development Private spending on pharmaceutical R&D and the approval of new drugs have both increased markedly in recent years, resuming a decades-long trend that was interrupted in 2008 as generic versions of some top-selling drugs became available and as the 2007–2009 recession occurred. **In particular, spending on drug R&D increased by nearly 50 percent between 2015 and 2019.** Many of the drugs approved in recent years are high-priced specialty drugs for relatively small numbers of potential patients. By contrast, the top-selling drugs of the 1990s were lower-cost drugs with large patient populations. R&D Spending R&D spending in the pharmaceutical industry covers a variety of activities, including the following: Invention, or research and discovery of new drugs; Development, or clinical testing, preparation and submission of applications for FDA approval, and design of production processes for new drugs; Incremental innovation, including the development of new dosages and delivery mechanisms for existing drugs and the testing of those drugs for additional indications; Product differentiation, or the clinical testing of a new drug against an existing rival drug to show that the new drug is superior; and Safety monitoring, or clinical trials (conducted after a drug has reached the market) that the FDA may require to detect side effects that may not have been observed in shorter trials when the drug was in development. In real terms**, private investment in drug R&D among member firms of the Pharmaceutical Research and Manufacturers of America (PhRMA), an industry trade association, was about $83 billion in 2019, up from about $5 billion in 1980 and $38 billion in 2000**.1 Although those spending totals do not include spending by many smaller drug companies that do not belong to PhRMA, the trend is broadly representative of R&D spending by the industry as a whole.2 A survey of all U.S. pharmaceutical R&D spending (including that of smaller firms) by the National Science Foundation (NSF) reveals similar trends.3 Although total R&D spending by all drug companies has trended upward, small and large firms generally focus on different R&D activities. **Small companies not in PhRMA devote a greater share of their research to developing and testing new drugs,** many of which are ultimately sold to larger firms (see Box 1). By contrast, a greater portion of the R&D spending of larger drug companies (including those in PhRMA) is devoted to conducting clinical trials, developing incremental “line extension” improvements (such as new dosages or delivery systems, or new combinations of two or more existing drugs), and conducting postapproval testing for safety-monitoring or marketing purposes.

#### On their impact – the Herald card just says “this could happen” and not that it will happen – apply a high burden of proof given that the pathway described in Srivatsa is literally just that of COVID – it’s a card from 2017 talking about a pandemic like SARS, animal-borne, to which the government responds poorly, and COVID hasn’t caused extinction

Hotez doesn’t solve NTDs – more innovation doesn’t axiomatically entail necessary innovation – there would just be a proliferation of cosmetic medical technologies without the HIF CP