**Extinction comes first under any framework**

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

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But **that is a huge mistake.** Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; **it is not the view that the latter don’t matter**. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” **Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good**, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. **We should also take into account moral uncertainty.** What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters)

# Case Level

## Trade Secrecy DA

#### Removing Patent protections will just encourage trade secrecy

**Raidt 14**, John Raidt, US Chamber of Commerce Foundation, “Patents and Biotechnology”<https://www.uschamberfoundation.org/patents-and-biotechnology>

What would our innovation system look like **without patents**? It’s hard to imagine that it would be much to look at given that **the primary alternative would be trade secrecy**. But the high cost of seeking patent protection overseas, among other reasons, is elevating the status of trade secrecy as an IP tool of choice, despite its chief shortcoming. As the NIH points out, “**trade secret protection lasts for as long as the secret is kept confidential. If the secret is never publicly disclosed, it will never lose its protection**. If the secret is uncovered by means of industrial espionage, disloyal employees, theft, or the like, the owner of the secret has legal recourse against those who misappropriated the secret, or anyone who procured it through such impropriety.” Protection is not afforded, however, “in the event that someone managed to successfully duplicate the recipe by legitimate means**.” A trend toward greater trade secrecy to avoid the pitfall of an insufficient patent regime poses two significant problems. For companies, it’s unsustainable because today’s technology makes inimitability exceedingly difficult to maintain. For society, it’s undesirable because secrecy deeply undermines the scientific process that feeds on the kind of transparency and collaboration that the patent system was conceived to deliver. Opting for trade secrecy over patent protection will have a chilling effect on innovation and threatens to undermine broad-ranging scientific advancement.** The quality of innovation touches our lives and enterprises in so many ways. Thus, we are all stakeholders in the patent debate and, in particular, the life science patent debate.

#### Trade Secrecy is bad

**Zink 18**, Julie Zink, University of Dayton, “When Trade Secrecy Goes Too Far: Public Health and Safety Should Trump Corporate Profits” Summer 2018 issue, Page 1142<https://ecommons.udayton.edu/cgi/viewcontent.cgi?article=1109&context=law_fac_pub> Livingston RB

Not surprisingly, there are also negatives involved in protecting **trade secrets**—namely, **providing a legal shield that corporations can use to conceal nefarious activities**. According to Bok, “[t]rade secrecy is the most frequent claim made by those who want to protect secrets in business”; corporations may assert such claims to protect legitimate secrets and, in some cases, to abuse or exploit their trade secret protections. Trade secrecy can cause harm. First, **trade secrecy** does not always promote one of its stated policy goals—innovation. Rather, it **encourages companies to engage in duplicative investment in research and development.** It also frustrates the disclosure goals of the patent system when companies opt for trade secrecy rather than patent protection. Second, **secrecy debilitates judgment**. If only a select few know the trade secret, then they are the only ones who can make decisions regarding the information at issue. **This postpones discovery of errors and effectively shuts out criticism from others who may be able to provide valuable feedback. As a result, faulty assumptions about risk may mean that little to no deliberation takes place regarding whether to continue, modify, or cease use of the trade secret**. Third, **secrecy has the capacity to corrupt and to invite abuse**. Due to others’ lack of knowledge regarding the trade secret, those with knowledge operate in a system free from oversight. **This lack of accountability coupled with the desire for higher profits** (for which they are held accountable) **results in a loosening of moral constraints.** When no one is present to hold a mirror up to their faces, they can downplay the consequences of their actions and disregard any negative impacts the trade secret may have on their employees, their consumers, the general public, or the environment.

### 1NC – Innovation DA

#### Innovation is steady now – COVID uplifted the market just enough to keep collaboration going.

**IP 20** [Idea Pharma, 4-6-2020, "These pharmaceutical companies are the top inventors and innovators," Fortune, <https://fortune.com/2020/04/06/top-pharmaceutical-companies-innovation-invention-2020/>] //DD PT

The 2020 Pharmaceutical Invention and Innovation Indices, compiled by [IDEA Pharma](https://www.ideapharma.com/), were generated prior to the unfolding [COVID-19 pandemic](https://fortune.com/tag/coronavirus/) and do not relate to what any pharmaceutical or biotech company is doing in relatifon to that particular challenge. There is a huge amount of work going into the existential threat posed by this virus, something that we have seen before. Perhaps the AIDS crisis represents the closest analogue—an industry that rallied quickly and produced treatments which sustain lives today. However, we all want to know more, at a period of uncertainty. The difference between putting out an idea, or bringing forth a viable product, is the difference between invention and innovation: Put simply, some companies are better at one than the other. As in the Parable of the Talents, the question most pertinent to the question of “productivity” in the [pharmaceutical industry](https://fortune.com/tag/pharmaceuticals/) is not “How much do you have?” but “If you gave the same product to two different companies, which would do the best with it?” That was the simple question first asked 10 years ago, with the Pharmaceutical Innovation Index—a ranking of which companies have been best at adding value to their pipelines over the past five years. It fits a classical definition of innovation as a measure of return on invention—separating the idea from its execution. $770 billion COMBINED GLOBAL REVENUE FOR THE TOP 30 PHARMACEUTICAL COMPANIES IN 2019 At a time when innovation is needed more than ever, this lesson is critical. The history taught to us in tales of Henry Ford, Thomas Edison, Steve Jobs, and Elon Musk tends to celebrate their ideas, whereas it is their execution, their organizations, that brought inventions to their audience: famously, the 99% perspiration instead of the 1% inspiration. If we put too much faith in inventions to self-determine their own fate, we lose sight of the role that great companies, and their people, play in bringing them, literally, to life. It is a surprise to many (especially within the industry) that good new drugs can be halted, or lost, in development by the inability of companies to guide them toward their patient destiny via the thousand small decisions, hurdles, and barriers that stand between an idea and its value. With so much excitement surrounding the addition of a promising candidate to a bulging development portfolio, it is an important reminder that companies differ widely in their ability to realize its talent. From tens of thousands of programs in the industry, we gain only 40 to 50 new drugs per year, and only 10 to 15 of those will deliver a return on its own investment. When we realize that, we see an engine like a ’70s Detroit V-8, guzzling fuel but with little effect on progress. Of 2019 revenues across the top 30 companies, the average return from products launched in the past five years was just 12%. (Some household names derived no significant revenue from “new” products.) When we wonder why drug pricing is such an issue, the natural focus falls upon on annual rises on old drugs. Unfortunately, some companies have no choice—they have no new products to rely upon. $4.5 billion AVERAGE COST OF LAUNCHING A NEW DRUG However, we don’t want to lose that twinkle: A pipeline full of novelty and meaningful opportunity is what we all want from a pharmaceutical company—potential answers to life’s most important questions. So, after 10 years of focusing on innovation exclusively, the Pharmaceutical Innovation Index gains a forward-looking statement—the Pharmaceutical Invention Index. The 2020 Index sees biotech mixing it up with the industry’s giants. As with the emergence of more fuel-efficient cars during the oil crisis, we’re seeing new players. With the dominance of rare and orphan disease approvals, more companies are finding they don’t need the traditional sales forces and development pathways. We also see that the industry is looking healthy globally, but Europe—with the exception of the U.K. and Switzerland—is dropping away as a player. —IDEA Pharma Highlighted companies Roche Innovation Index rank: 1 Invention Index rank: 10 Number of employees: 97,735 2019 revenue: $63.638 billion Headquarters: Basel, Switzerland [Roche](https://fortune.com/2020/03/13/coronavirus-test-roche-covid-19/) has jumped seven spots from 2019 to finish first, the first time the Swiss company has done so. The company benefited from multiple clinical data wins, a pair of novel FDA approvals, and many path-leading immuno-oncology firsts by its PD-L1, Tecentriq. AbbVie Innovation Index rank: 2 Invention Index rank: 7 Number of employees: 30,000 2019 revenue: $32.75 billion Headquarters: North Chicago, Ill., U.S. Runner-up on this year’s Innovation Index (and seventh overall on the Invention ranking) is [AbbVie](https://fortune.com/company/abbvie). A model of consistency, [AbbVie](https://fortune.com/longform/abbvie-humira-drug-costs-innovation/) has held the second position two years in a row. Novartis Innovation Index rank: 3 Invention Index rank: 4 Number of employees: 103,914 2019 revenue: $51.9 billion Headquarters: Basel, Switzerland Novartis had a historic year in terms of regulatory approvals notching an unprecedented five novel drugs, helping catapult the company from ninth on the Innovation Index in 2019 to third in 2020. Notably, the company also sustained its Invention ranking—finishing fourth overall in back-to-back years, suggesting a promising future. Vertex Innovation Index rank: 3 Invention Index rank: 9 Number of employees: 3,000 2019 revenue: $4.164 billion Headquarters: Boston, Mass., U.S. With the help of the FDA approval of potential blockbuster cystic fibrosis (CF) drug Trikafta, Vertex burst onto the Innovation scale in 2019, as the best-performing biotech by far. Eli Lilly Innovation Index rank: 5 Invention Index rank: 3 Number of employees: 33,625 2019 revenue: $22.32 billion Headquarters: Indianapolis, Ind., U.S. After experiencing a jump from No. 13 in 2018 to third on the 2019 Innovation scale, [Eli Lilly](https://fortune.com/company/eli-lilly) has settled into the fifth spot on this year’s Index. Despite the two-spot drop, Lilly’s Invention scale ranking of third for 2020 implies that the company isn’t going anywhere anytime soon. AstraZeneca Innovation Index rank: 6 Invention Index rank: 1 Number of employees: 61,100 2019 revenue: $24.384 billion Headquarters: Cambridge, U.K. After dipping from first in 2018 to No. 12 in 2019 on the Innovation scale, AstraZeneca is back in the top 10. With no new drug or BLA approvals coming in 2019, the vast majority of AstraZeneca’s success came from positive clinical data, and progression in the pipeline, which in turn landed the company in first place on the Invention scale. 1,200 NUMBER OF DRUGS IN DEVELOPMENT IN OVER 1,900 CLINICAL STUDIES AMONG THE TOP 30 PHARMACEUTICAL COMPANIES Alexion Innovation Index rank: 7 Invention Index rank: 24 Number of employees: 2,525 2019 revenue: $4.991 billion Headquarters: Boston, Mass., U.S. Leading the charge on the Innovation front for Alexion is the blockbuster drug Soliris, and the emergence of its successor, Ultomiris.

#### IP protections for medicines are necessary for innovation in the field of pharmaceuticals.

**Wilbur 19** [Tom Wilbur, 4-16-2019, "IP Explained: Why patents are so critical to biopharmaceutical innovation," PhRMA, <https://catalyst.phrma.org/ip-explained-why-patents-are-so-critical-to-biopharmaceutical-innovation>] //DD PT

Many essential industries rely on the U.S. patent system to foster innovation. [Research](http://phrma-docs.phrma.org/sites/default/files/pdf/2014-economic-futures-report.pdf) has identified that an IP system that provides robust patent rights and regulatory protection is key to driving biopharmaceutical growth in the United States and sustaining continued investment in the lengthy and costly R&D process needed to develop new medicines. Biopharmaceutical companies differ from other industries in terms of the level of scientific and regulatory uncertainty, long time horizons and high costs of R&D. In addition, while the law has established a patent term of 20 years from the patent application filing date, given the nature of the R&D process, up to half of the patent term may be lost before a medicine is ultimately reviewed and approved by the U.S. Food and Drug Administration (FDA). The facts are that, for the biopharmaceutical industry, the availability of patents enables companies to invest an average of $2.6 billion over a 10 to 15-year period to bring a medicine to patients and enables them to accept the risk that only 12% of investigational medicines will ultimately be approved by the FDA. Patents incentivize different forms of biopharmaceutical innovation, and a medicine may be associated with multiple types of patents that may cover such aspects as the biologically active component of a drug, as well as the composition of dosage forms, methods of manufacturing and use in a particular therapeutic indication. While a single medicine, like any other product, may be covered by a range of patents, individual patents may also be part of a larger technology solution or platform applicable to different products. Innovation doesn’t stop when a new medicine is brought to market. In fact, biopharmaceutical companies are constantly innovating toward better medicines for better health. Because of a strong U.S. patent system, the U.S. biopharmaceutical industry is willing to invest more than any other industry in R&D and bring forward medical advances critical to addressing some of our most challenging diseases. Robust IP protections including patents are necessary to foster the investments that allow researchers to harness scientific and technological breakthroughs as they develop new medicines that improve and save lives.

#### African pharmaceutical industries are still underdeveloped, but investment is growing. Any assistance for the African pharmaceutical industry is good.

**Idris 20** [Abubakar Idris, 16-03-2020, "Investor interest in Africa’s innovative pharma business is growing," TechCabal, <https://techcabal.com/2020/03/16/lifestores-seed-funding/>] //DD PT

Pharmacies are the first contact for millions of Africans accessing healthcare services on the continent. This makes the business a big one. The African pharma market is worth over [$50 billion](https://techcabal.com/2020/03/11/nigerian-health-startup-field-intelligence-funding/). In Nigeria, [McKinsey predicts](https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/winning-in-nigeria-pharmas-next-frontier) that the market could grow as high as 9 per cent annually by 2026, contributing between $950 million and $1.1 billion during this period. But the business is underdeveloped. The demand is high but the supply chain is broken, causing many drug stores to run out of important products quickly and longer times to restock. In most parts of the continent, quality drugs are exported. The supply chain is dominated by a few middlemen who have the links and resources to bring drugs into the country. To augment supply, some chemists fall victim to fake drugs, putting the lives of their customers at risk. According to the [United Nations Industrial Development Organisation (UNIDO)](https://www.unido.org/sites/default/files/2011-04/Nigeria_Pharma%20Sector%20Profile_032011_Ebook_0.pdf) [PDF], fakes account for around 30% of drugs in circulation in the Nigerian market. This is a problem. Over the last five years, a number of innovators have identified this problem and have developed their own tech solutions to address it. [Lifestores](https://techcabal.com/2019/10/07/lifestores-wants-to-change-nigerias-pharma-business-using-technology/) is one company doing this. They are on a “mission to democratize access to quality healthcare,” the company told TechCabal. Lifestores started operations in 2017 to make quality and affordable drugs available for the mass market. It started operations in 2017 and is using a different go-to-market strategy. Rather than restrict itself to quality drugs delivery to third-party pharmacies, Lifestores has gone into the business for itself. It has opened a number of drug stores to understand the challenges chemists are facing in their daily operations. In 2019, it operated three stores in Yaba, Ilupeju and Festac. It acquired a fourth store in early 2020 and is on course to take over another store. Lifestores has developed a software component to its operation for inventory management and to address supply chain issues. It is working directly with pharmaceutical companies to purchase its stock. This makes its drugs cheaper and high quality. Between 2018 and 2019, its sales have grown by five times, the company told TechCabal. For the long term, the company is focused on the mass market. It wants to work with thousands of pharmacies to develop a network of stores in Nigeria. In the West African country, “the [pharmacy] space is incredibly fragmented,” Andrew Garza, Lifestores’ COO [told TechCabal](https://techcabal.com/2019/10/07/lifestores-wants-to-change-nigerias-pharma-business-using-technology/) in October 2019. The market leaders own just 2% of the market, “they’re quite small compared to other markets like South Africa where the single lead tends to have as much as 30% of market share,” he said. For its franchising model, Lifestores provides third-party stores (which it calls affiliates) with the software to manage their processes and inventory. “We’ve developed the software that will be the foundation of the program,” Garza told TechCabal. “[We] are currently testing it in our own stores before rolling it out to 3rd party pharmacies.” By the end of March or the next quarter, Lifestores will roll out the pilot to include third-party stores. The full rollout would happen later in the year. “The focus of the program will be on helping pharmacies manage their inventory more efficiently,” Garza said, “providing them with group purchase discounts and enabling them to better serve customers.” The company recently closed an over $1 million seed-stage funding round. The round was led by Consonance Investment Managers. Other investors who participated include Flying Doctors Nigeria Group & the Greentree Syndicate, the StartUp Health Transformer Fund, Altadore Lionbear Capital, Unseen Ventures, K50 Ventures, Chinook Capital and Kepple Africa Ventures. A number of angel investors also invested in this round. Lifestores is not the only pharma-focused company generating a buzz. Field Intelligence is another startup attracting a lot of attention. The health-tech company is focused on supply chain issues for pharmacies. It has around 280 pharmacies signed up to its service. The five-year-old company just [closed a $3.6 million Series A](https://techcabal.com/2020/03/11/nigerian-health-startup-field-intelligence-funding/) round led by Blue Haven Initiative, one of the world’s biggest impact investors. Ghana’s mPharma is one of the biggest movers in the African retail drug market. The seven-year-old company raised $12 million Series B funding last year. It operates in five countries and expanded to Kenya by acquiring the country’s second-largest pharmacy chain. 54gene, a Nigerian startup, is providing pharma companies with genomics data about Africans that makes it easier for them to develop effective drugs. The startup raised $4.5 million in 2019. In 2018, Nigerian pharmacy chain, [HealthPlus raised $18 million](https://www.businesswire.com/news/home/20180327005256/en/Alta-Semper-Capital-LLP-commits-US18-million) from Alta Semper Capital, a London-based investor. Founded in 1999, Health Plus has 80 stores and plans to expand across West Africa. In February, [three Ghanaian pharmaceutical companies merged](https://africanbusinessmagazine.com/african-banker/ghana-pharma-firms-merge-into-single-giant/) to create the largest drug company in the country. The new entity, Dannex Ayrton Starwin Plc or DAS Pharma, will produce around 80 drugs and is planning to expand across Africa. Daniel Apeagyei Kissi, DAS Pharma’s CEO, said the new entity will take advantage of new trends in the market spurred by tech. “[DAS Pharma] is coming into the market at an opportune time when the industry as we know is changing,” a [Ghanaian publication](https://www.graphic.com.gh/business/business-news/three-local-pharmaceutical-companies-merge-lists-on-gse-as-das-pharma.html) quoted him as saying. “Consumer and customer needs are changing, industry players are integrating vertically, dealer-owned brands are appearing on the market and technology is manifesting in online pharmacies, electronic payment, online healthcare systems [and] online doctors.” “DAS Pharma is well placed to respond to and take advantage of to make even greater history,” he said. These are exciting activities in the pharma market and could fuel more investor interests.

#### The only way that we can ensure that we can counter highly deadly pandemics is through pharmaceutical drug development and innovation.

**Madhav et al 17** [Madhav N, Oppenheim B, Gallivan M, et al. Pandemics: Risks, Impacts, and Mitigation. In: Jamison DT, Gelband H, Horton S, et al., editors. Disease Control Priorities: Improving Health and Reducing Poverty. 3rd edition. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2017 Nov 27. Chapter 17. Available from: https://www.ncbi.nlm.nih.gov/books/NBK525302/ doi: 10.1596/978-1-4648-0527-1\_ch17] //DD PT

Vaccines, antibiotics, and antiviral drugs can play a critical role in mitigating a pandemic by reducing the infectiousness of symptomatic patients and the susceptibility of uninfected individuals. Antivirals may reduce influenza transmission, although the extent of their effectiveness is unclear ([Ferguson and others 2005](https://www.ncbi.nlm.nih.gov/books/NBK525302/); [Jefferson and others 2014](https://www.ncbi.nlm.nih.gov/books/NBK525302/)). A systematic review of clinical trial data among treated adults showed that oseltamivir reduced the duration of influenza symptoms by 17 hours, but prophylaxis trials found no significant reduction of transmission ([Jefferson and others 2014](https://www.ncbi.nlm.nih.gov/books/NBK525302/)). If available, vaccines can reduce susceptibility. Significant efforts have focused on speeding up vaccine development and scaling up production. However, the availability of vaccines—particularly in LMICs—depends on the affected area’s capacity for distribution (including the scale and integrity of the cold chain), its capacity for last-mile delivery to rural areas, and the population’s willingness to adopt the vaccine. Vaccination strategies targeting younger populations may be especially beneficial, in part because influenza transmissibility is higher among younger populations during pandemics ([Miller and others 2008](https://www.ncbi.nlm.nih.gov/books/NBK525302/)). The effectiveness of antivirals, antibiotics, and vaccines in reducing spread diminishes if the pandemic is already global, if LMICs cannot afford adequate vaccine stocks for their populations, or if specific populations (for example, the poor or the socially vulnerable) cannot access vaccines. Additionally, pandemics may be caused by a pathogen without an available vaccine or efficacious biomedical therapy. Efforts to improve the vaccine development pipeline are underway ([box 17.3](https://www.ncbi.nlm.nih.gov/books/NBK525302/box/pt5.ch17.sec4.box3/?report=objectonly)).

#### Future pandemics are going to cause extinction – gut micro bacteria will mutate into deadly diseases which would threaten humanity.

**Diamandis 21** [Diamandis, E. The Mother of All Battles: Viruses vs. Humans. Can Humans Avoid Extinction in 50-100 Years?. Preprints 2021, 2021040397] //DD PT

The recent SARS-CoV-2 pandemic, which is causing COVID 19 disease, has taught us unexpected lessons about the dangers of human extinction through highly contagious and lethal diseases. As the COVID 19 pandemic is now being controlled by various isolation measures, therapeutics and vaccines, it became clear that our current lifestyle and societal functions may not be sustainable in the long term. We now have to start thinking and planning on how to face the next dangerous pandemic, not just overcoming the one that is upon us now. Is there any evidence that even worse pandemics could strike us in the near future and threaten the existence of the human race? The answer is unequivocally yes. It is not necessary to get infected by viruses of bats, pangolins and other exotic animals that live in remote forests in order to be in danger. Creditable scientific evidence indicates that the human gut microbiota harbor billions of viruses which are capable of affecting the function of vital human organs such as the immune system, lung, brain, liver, kidney, heart etc. It is possible that the development of pathogenic variants in the gut can lead to contagious viruses which can cause pandemics, leading to destruction of vital organs, causing death or various debilitating diseases such as blindness, respiratory, liver, heart and kidney failures. These diseases could result in the complete shutdown of our civilization and probably the extinction of human race. In this essay, I will first provide a few independent pieces of scientific facts and then combine this information to come up with some (but certainly not all) hypothetical scenarios that could cause human race misery, even extinction. I hope that these scary scenarios will trigger preventative measures that could reverse or delay the projected adverse outcomes