**2nd innovation DA**

**Patents spur new innovation and are crucial in closing the knowledge gap between rich and poor countries. Without IPP, there is no incentive to invent and new tech development falls short. WIPO 17**

Ensuring That, xx-xx-xxxx, "Innovation and Intellectual Property," No Publication, https://www.wipo.int/ip-outreach/en/ipday/2017/innovation\_and\_intellectual\_property.html, 8-25-2021 //WHS-AC

**Inventions are the bedrock of innovation**. An **invention[s]** is a new solution to a technical problem and **can be protected through**[**patents**](https://www.wipo.int/patents/en/). Patents **protect the interests of inventors** whose technologies are truly groundbreaking and commercially successful, by **ensuring that an inventor [they] can control the commercial use of their invention**. An individual or company that holds a patent has the right to prevent others from making, selling, retailing, or importing that technology. This **creates opportunities for inventors to sell, trade or license their patented technologies** with others who may want to use them. The criteria that need to be satisfied to obtain a patent are set out in [national IP laws](https://www.wipo.int/wipolex/en/) and may differ from one country to another. But generally, to obtain a patent an inventor needs to demonstrate that their technology is new (novel), useful and not obvious to someone working in the related field. To do this, they are required to describe how their technology works and what it can do. A patent can last up to 20 years, but the patent holder usually has to pay certain fees periodically throughout that 20-year period for the patent to remain valid. In practice, this means that if a technology has limited commercial value, the patent holder may decide to abandon the patent, at which point the technology falls into the public domain and may be freely used. Patent information In addition to **recognizing and rewarding inventors for their commercially successful technologies**, patents also **tell the world about inventions**. In order to gain patent protection for their invention, the inventor must provide a detailed explanation of how it works. In fact, every time a patent is granted, the amount of [technological information](https://www.wipo.int/patents/en/faq_patents.html#info) that is freely available to the general public expands (see [Using and Exploiting Patent Information tutorial](https://www.wipo.int/tisc/en/etutorial/main.html)). WIPO is making this and other IP-related information freely available to the public through its global databases. The largest of these – it is also one of the largest in the world – is [PATENTSCOPE](https://www.wipo.int/patentscope/en/). It contains over 50 million patent applications that can be searched free of charge. The aim in making this information widely available is to **spark new ideas** and **promote more innovation,** and also **to help narrow the knowledge gap which exists in developing and least developed countries**.

**Innovation drives the future of the pharmaceuticals, advancing drug development and raising the health care bar. No innovation = no new medicines or vaccines. Buffery 15**

Dalia Buffery, xx-xx-xxxx, "The 2015 Oncology Drug Pipeline: Innovation Drives the Race to Cure Cancer," PubMed Central (PMC), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4489190/, 8-26-2021 //WHS-AC

**“Innovation drives progress**,” suggests the US Food and Drug Administration (FDA) in its report on the 41 new molecular entities and new biologic pharmaceuticals that were approved in 2014.[1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4489190/#R1) This perspective is echoed by the FDA's Center for Drug Evaluation and Research (CDER) **as the rationale for its support for innovation in the pharmaceutical industry**. The CDER states, “**The availability of new drugs and biological products often means new treatment options for patients and advances in health care for the American public**. For this reason, CDER **supports innovation** and plays a key role in **helping to advance new drug development**.” More recently, in a provocative article published in this journal and titled “Breaking the Bank: Three Financing Models for Addressing the Drug Innovation Cost Crisis,” Kleinke and McGee argue that **drug innovation is key to medical advances**, **especially in deadly diseases** such as cancer: to ensure continuing innovation in drug therapies, what is needed is not to halt funding innovation but rather to find a new way to pay for drugs. “**Innovative new treatments** designed to address serious diseases in targeted patient populations **represent the future of medicine.** Traditional payment methodologies need to change to keep pace with medical innovation,” Kleinke and McGee propose, offering 3 models for consideration that will help pay for drugs in a novel way and allow drug innovation to continue in its path. Reflecting on oncology drugs in its 2014 report, the IMS Institute for Healthcare Informatics (henceforth, IMS) **highlighted innovation as a key feature in the oncology pipeline**. According to that report, “Developers have brought innovation across cancer types and therapeutic approaches, including preventive vaccines. Pharmaceutical company investments remain high and cancer therapies account for more than 30% of all preclinical and phase 1 clinical development, with 21 new molecular entities being launched and reaching patients in the last two years alone. These new medicines have increased the complexity of treating cancer, leading to more combination therapies and additional lines of therapy.”

**New vaccine technology development is key to mitigate the outbreak of infectious diseases, without them pandemics will be catastrophic. Excler, Saville, Berkley, & Kim 21**

Excler, JL., Saville, M., Berkley, S. et al. Vaccine development for emerging infectious diseases. Nat Med 27, 591–600 (2021). <https://doi.org/10.1038/s41591-021-01301-0> //WHS-AC

**Vaccines are the cornerstone of the management of infectious disease outbreaks** and are the **surest means to defuse pandemic and epidemic risk**. The faster a vaccine is deployed, **the faster an outbreak can be controlled**. As discussed in the previous section, the standard vaccine development cycle is **not suited to the needs of explosive pandemics**. New vaccine platform technologies however may shorten that cycle and make it **possible for multiple vaccines to be more rapidly developed, tested and produced**[**34**](https://www.nature.com/articles/s41591-021-01301-0#ref-CR34). Table [2](https://www.nature.com/articles/s41591-021-01301-0#Tab2) provides examples of the most important technical vaccine platforms for vaccines developed or under development for emerging viral infectious diseases. **Two COVID-19 vaccines were develope**d using mRNA technology (Pfizer–BioNTech[35](https://www.nature.com/articles/s41591-021-01301-0#ref-CR35) and Moderna[36](https://www.nature.com/articles/s41591-021-01301-0#ref-CR36)), **both showing safety and high efficacy**, and now with US Food and Drug Administration (FDA) emergency use authorization (EUA)[37](https://www.nature.com/articles/s41591-021-01301-0#ref-CR37),[38](https://www.nature.com/articles/s41591-021-01301-0#ref-CR38) and European Medicines Agency (EMA) conditional marketing authorization[39](https://www.nature.com/articles/s41591-021-01301-0#ref-CR39),[40](https://www.nature.com/articles/s41591-021-01301-0#ref-CR40). While **innovative and encouraging** for other EIDs, it is too early to assert that mRNA vaccines represent a universal vaccine approach that could be broadly applied to other EIDs (such as bacterial or enteric pathogens). While COVID-19 mRNA vaccines are a useful proof of concept, gathering lessons from their large-scale deployment and effectiveness studies still requires more work and time. While several DNA vaccines are licensed for veterinary applications, and DNA vaccines have shown safety and immunogenicity in human clinical trials, no DNA vaccine has reached licensure for use in humans[41](https://www.nature.com/articles/s41591-021-01301-0#ref-CR41). Recombinant proteins vary greatly in design for the same pathogen (for example, subunit, virus-like particles) and are often formulated with adjuvants but have longer development times. Virus-like particle-based vaccines used for hepatitis B and human papillomavirus are safe, highly immunogenic, efficacious and easy to manufacture in large quantity. **The technology is also easily transferable**. Whole inactivated pathogens (for example, SARS-CoV-2, polio, cholera) or live attenuated vaccines (for example, SARS-CoV-2, polio, chikungunya) are unique to each pathogen. Depending on the pathogen, these vaccines also may require biosafety level 3 manufacturing (at least for COVID-19 and polio), which may limit the possibility of technology transfer for increasing the global manufacturing capacity. Other vaccines are based on recombinant vector platforms, subdivided into nonreplicating vectors (for example, adenovirus 5 (Ad5), Ad26, chimpanzee adenovirus-derived ChAdOx, highly attenuated vectors like modified vaccinia Ankara (MVA)) and live attenuated vectors such as the measles-based vector or the vesicular stomatitis virus (VSV) vector. Either each vector is designed with specific inserts for the pathogen targeted, or the same vector can be designed with different inserts for the same disease. The development of the Merck Ebola vaccine is an example. ERVEBO is a live attenuated, recombinant VSV-based, chimeric-vector vaccine, where the VSV envelope G protein was deleted and replaced by the envelope glycoprotein of *Zaire ebolavirus*. ERVEBO is safe and highly efficacious, now approved by the US FDA and the EMA, and WHO prequalified, making VSV an attractive ‘platform’ for COVID-19 and perhaps for other EID vaccines[26](https://www.nature.com/articles/s41591-021-01301-0#ref-CR26) although the −70 °C ultracold chain storage requirement still presents a challenge. Other equally important considerations are speed of development, ease of manufacture and scale-up, ease of logistics (presentation, storage conditions and administration), technology transfer to other manufacturers to ensure worldwide supply, and cost of goods. Viral vectors such as Ad5, Ad26 and MVA have been used in HIV as well as in Ebola vaccines[42](https://www.nature.com/articles/s41591-021-01301-0#ref-CR42). Finally, regulatory authorities do not approve platforms but vaccines. Each vaccine is different. However, with each use of a specific technology, regulatory agencies may, over time, become more comfortable with underlying technology and the overall safety and efficacy of the vaccine platform, allowing expedited review and approvals in the context of a pandemic[43](https://www.nature.com/articles/s41591-021-01301-0#ref-CR43). With COVID-19, it meant that the regulatory authorities could permit expedited review of ‘platform’ technologies, such as RNA and DNA, that had been used (for other conditions) and had safety profiles in hundreds of people. A heterologous prime–boost (HPB) vaccine approach has been extensively explored for HIV[44](https://www.nature.com/articles/s41591-021-01301-0#ref-CR44) and Ebola vaccines[42](https://www.nature.com/articles/s41591-021-01301-0#ref-CR42). It is being investigated for COVID-19 vaccines with the Oxford–AstraZeneca AZD1222 and Gamaleya Sputnik V COVID-19 vaccines[45](https://www.nature.com/articles/s41591-021-01301-0#ref-CR45) or with the Pfizer–BioNTech vaccine (<https://www.comcovstudy.org.uk>). Other HPB combinations might be considered involving mRNA, DNA, viral vector-based and protein-based vaccines. This may offer the potential benefit of improving the immune response and avoiding mutlidose reactogenicity or anti-vector immune responses. Additionally, people previously vaccinated with the standard regimen (for example, single or two dose) could be offered a booster immunization with a different vaccine. This might mitigate current shortages in vaccines, particularly in low- and middle-income countries (LMICs). Such a matrix of HPB possibilities deserves further consideration by manufacturers, funders and regulators supported by clinical trial studies and assessment of implementation challenges. **Important improvements** could speed up availability. Standardized labeling of vaccines so that they can be interchanged across countries and regions, date of production rather than expiration so that shelf life can be tracked, three-dimensional bar coding to allow critical information to be updated, standard indemnification and liability language that would allow agreement with all manufacturers, a no-fault compensation mechanism for serious adverse events related to vaccine administration, and regulatory harmonization are **all critical and being worked on as part of the COVID-19 vaccine response and must be optimized for future outbreaks**.

**Studies show new pandemics are on the way, much worse than COVID-19. Barnes, 21**

By, 6-23-2021, "US Army scientists warn worse pandemics are coming soon," TheHill, https://thehill.com/changing-america/well-being/prevention-cures/559796-us-army-scientists-warn-worse-pandemics-are, 8-29-2021 //WHS-AC

**Scientists studying coronavirus vaccines** at the Walter Reed Army Institute of Research are **warning that the pandemic could be followed by an even larger and potentially deadly viral outbreak**. Speaking at the Defense One 2021 Tech Summit on Monday, Kayvon Modjarrad, director of Walter Reed’s infectious diseases branch, argued that **the probability of this generation encountering another pandemic “is high**,”[Defense One reported](https://www.defenseone.com/technology/2021/06/may-not-be-big-one-army-scientists-warn-deadlier-pandemics-come/174853/). “We have seen the acceleration of these pathogens and the epidemics that they precipitate. And it may not be a coronavirus, **this may not be the big one,**” Modjarrad said, according to the outlet. “There may be something that's **more transmissible and more deadly ahead of us**.”  “We have to think more broadly, not just about COVID-19, not just about coronavirus, but **all emerging infectious threats coming into the future,”** Modjarrad The team at Walter Reed has been working on developing vaccines not only for COVID-19 but also potential new viruses, according to Defense One. Researchers thus far have conducted testing of their spike ferritin nanoparticle, or SpFN, vaccine on nonhuman specimens, although the group is in the early stages of human trials. **“If we try to chase the viruses after they emerge, we're always going to be behind,**” Modjarrad said. Director for the Centers for Disease Control [Rochelle Walensky said](https://thehill.com/changing-america/well-being/prevention-cures/559670-cdc-director-says-vaccinations-make-adult-covid) at a press briefing on Tuesday that the availability of effective vaccines has made adult COVID-19 deaths “entirely preventable.  "This new virus forced too many of our families to accept death as an outcome for too many of our loved ones, but now this should not be the case," Walensky added. CDC [data shows that 65 percent](https://covid.cdc.gov/covid-data-tracker/#vaccinations) of eligible U.S. adults have received at least one vaccine dose, while 45.3 percent of the total population has been fully vaccinated.

**Pandemics cause mass death and extinction. Pamlin and Armstrong 15**

Dennis Pamlin, Executive Project Manager Global Risks, Global Challenges Foundation, and Stuart Armstrong, James Martin Research Fellow, Future of Humanity Institute, Oxford Martin School, University of Oxford, February 2015, “Global Challenges: 12 Risks that threaten human civilization: The case for a new risk category,” Global Challenges Foundation, p.30-93, https://api.globalchallenges.org/static/wp-content/uploads/12-Risks-with-infinite-impact.pdf

4 Global A pandemic (from Greek πᾶν, pan, “all”, and δῆμος demos, “people”) is an epidemic of infectious disease that has spread through human populations across a **large region**; for instance **several continents**, or even **worldwide**. Here only worldwide events are included. A widespread endemic disease that is stable in terms of how many people become sick from it is not a pandemic. 260 84 Global Challenges – Twelve risks that threaten human civilisation – The case for a new category of risks 3.1 Current risks 3.1.4.1 Expected impact disaggregation 3.1.4.2 Probability Influenza subtypes266 Infectious diseases have been one of the **greatest causes of mortality in history**. Unlike many other global challenges pandemics have happened recently, as we can see where reasonably good data exist. Plotting historic epidemic fatalities on a log scale reveals that these tend to follow a **power law with a small exponent**: many plagues have been found to follow a power law with exponent 0.26.261 These kinds of power laws are **heavy-tailed**262 to a significant degree.263 In consequence most of the fatalities are accounted for by the **top few events**.264 If this law holds for future pandemics as well,265 then the majority of people who will die from epidemics will likely die from the **single largest pandemic**. Most epidemic fatalities follow a power law, with some extreme events – such as the Black Death and Spanish Flu – being even more deadly.267 There are other grounds for suspecting that such a highimpact epidemic will have a **greater probability** than **usually assumed**. All the features of an extremely devastating disease **already exist in nature**: essentially **incurable** (Ebola268), nearly always **fatal** (rabies269), **extremely infectious** (common cold270), and **long incubation periods** (HIV271). If a pathogen were to emerge that somehow **combined these features** (and influenza has demonstrated **antigenic shift**, the ability to combine features from different viruses272), its death toll would be extreme. Many relevant features of the world have changed considerably, making past comparisons problematic. The modern world has better sanitation and medical research, as well as national and supra-national institutions dedicated to combating diseases. Private insurers are also interested in modelling pandemic risks.273 Set against this is the fact that **modern transport** and **dense human population** allow infections to spread much more rapidly274, and there is the potential for urban slums to serve as breeding grounds for disease.275 Unlike events such as nuclear wars, pandemics would not damage the world’s infrastructure, and initial survivors would likely be resistant to the infection. And there would probably be survivors, if only in isolated locations. Hence the risk of a civilisation collapse would come from the **ripple effect** of the fatalities and the policy responses. These would include **political and agricultural disruption** as well as **economic dislocation** and damage to the world’s **trade network** (including the food trade). **Extinction risk** is only possible if the aftermath of the epidemic **fragments and diminishes human society** to the extent that recovery becomes impossible277 before humanity succumbs to **other risks** (such as **climate change** or **further pandemics**). Five important factors in estimating the probabilities and impacts of the challenge: 1. What the true probability distribution for pandemics is, especially at the tail. 2. The capacity of modern international health systems to deal with an extreme pandemic. 3. How fast medical research can proceed in an emergency. 4. How mobility of goods and people, as well as population density, will affect pandemic transmission. 5. Whether humans can develop novel and effective anti-pandemic solutions.

**Climate change DA**

**No IPPs = no monetary incentive to invest in new R&D, innovation falls short. Lewis 08**

James A. Lewis, xx-xx-xxxx, "," No Publication, https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy\_files/files/publication/080802\_LewisIntellectualProperty\_Web.pdf, 8-29-2021 //WHS-AC

All the counterarguments undervalue the benefits of strong IPR for innovation. Innovation **entails risk; it is a gamble**. The innovator wagers that **future sales will repay an in- vestment in creating a new product**. IPR reduces the risk that another individual can copy an idea and reap the rewards without sharing the risks. Weak IPR creates uncertainty and **disincentives for innovation**. We know that in the absence of adequate IPR, **fewer people will accept the risks involved with innovation and that the rate and scope of innovation will slow**. Innovation is a complex process, and many factors affect it. IP is only one such fac- tor. As many people have pointed out, strong IPR alone will not produce innovation. Nevertheless, **the most innovative economies are clearly those with strong IP protection**. Economies with weak IP protection **are less innovative** and less competitive in the global economy (see figure ES.1). The explanation for this correlation between IPR and performance is also complex. IP protection is part of the infrastructure of rules and laws that make economies more productive and more innovative. **IP protection reduces the risks associated with innova- tion**: an inventor takes a gamble in creating a new product, whether it is a new soda or a new semiconductor that **requires immense research and development (R&D) investment**. Without IP protection and the incentives it provides, **fewer people will accept the risks or will make the investments required for innovation**. Some argue that strong IPR is no longer important, as there are alternatives that will create equal or greater amounts of innovation. The problem with these alternatives is that they tend not to work. Government subsidies are inefficient compared to IPR. Greater openness may work for some intangible or digital products, but it does not work for most other products, particularly those that are tangible or that require large investments in re- search or in production. The development and widespread use of digital technologies have substantially changed the cost of producing and sharing anything that can be reduced to bytes. Some analysts generalize the effect of digital technologies on software or music to all industries. That generalization is inaccurate. The rising cost of innovation means that weak IP could likely depress global eco- nomic growth by slowing innovation. **The amount of R&D required for the production of manufactured goods has increased steadily over the past three decades** (see figure ES.2). That increase means that a company or person must spend more on first developing new knowledge in order to be able to make a new or improved product. **Innovation is not cheap**. Companies must spend an i**ncreasing amount of R&D to develop new products, and IP protections play a part in a company’s decision about whether to make that invest- ment**. If IP rights are weak, some investors will **choose less-risky investments** **rather than spend on innovation.**

**Pharmaceutical and tech innovation is extremely interconnected, medical R&D spills over into many tech sectors such as green technology. Wentworth 17**

Pharma Letter, 2-7-2018, "When two worlds collide — big pharma meets big tech," No Publication, https://www.thepharmaletter.com/article/are-big-pharma-and-big-tech-on-a-collision-course, 8-29-2021 //WHS-AC

Drug discovery itself **is increasingly dependent on digital technologies and software models** more commonly seen in a Californian tech company, making **the gaps between Silicon Valley startup and established drugmakers smaller, and blurring the lines between these industries**. In recent years, a **plethora of drug discovery platforms have emerged, utilizing highly sophisticated computational models driven by the sorts of algorithms you’d expect to find in development at Google** - including **artificial intelligence concepts**. For example, America’s Merck & Co (NYSE: MRK) is working with San Francisco-based Atomwise to identify neurological candidates, using deep learning technology. Deep learning - crudely put, the idea of refining algorithms by processing massive amounts of data through hierarchical layers of neural networks - has shown exciting results in image and voice recognition, and is garnering attention in the life sciences for that reason. One commonly cited application is in diagnostics, where it is believed that software may more reliably be able to detect abnormalities, such as tumors, than clinicians. Researchers at [Stanford University](http://news.stanford.edu/2017/04/03/deep-learning-algorithm-aid-drug-development/) have gone further, using this concept to predict the toxicity or potential side effects of drug candidates. Slava Akmaev, chief analytics officer at BERG, an East Coast biotech firm funded largely by West Coast real estate titan Carl Berg, believes another kind of machine learning may be more effective at identifying novel candidates. *"We can mechanistically track from molecular features to clinical features, to other molecular features."* "We looked at alternative ways to analyse data, focusing eventually on Bayesian artificial intelligence. Our technology is based on some of the seminal work by Judea Pearl at Stanford in the 1980s, and others." "Neural networks work really well in image analysis, correlating for example radiographs with disease progression or other medical outcomes. But it doesn't work that well with molecular data. Others tried to use it, back in 2000, with very limited results." "The major difference with Bayesian networks is that it's a white box classifier. Instead of looking for patterns and identifying associations, this approach allows us to build a mechanistic understanding of how molecular pathways drive certain phenotypes, certain pathophysiologies in the patient." "We can mechanistically track from molecular features to clinical features, to other molecular features." The company’s artificial intelligence platform is designed to sift through internally generated and externally sourced biological datasets. The aim, ultimately, is to develop novel candidates, and the company has had some validation of its approach, in the form of lead candidate BPM-31510, which has delivered [promising Phase II data](https://berghealth.com/berg-presents-key-clinical-data-at-esmo-2017-on-bpm-31510-for-advanced-pancreatic-cancer-patients-and-bpm-31543-for-preventing-hair-loss-in-patients-treated-with-chemotherapy/) in pancreatic cancer. The candidate has a new mechanism of action. As chief scientific officer Ranga Sarangarajan explains: "The drug has the ability to reverse the Warburg effect, starving the cancer of energy. We got this mechanism out of the platform, using biology-AI combination. It's a reverse validation of our approach." BERG has also had interest from major players, in the form of a deal with AstraZeneca (LSE: AZN). (Fellow British drugmaker GlaxoSmithKline (LSE: GSK) is exploring its own [AI collaboration](https://www.thepharmaletter.com/article/gsk-links-with-ai-spinout-to-cut-costs-and-speed-drug-discovery) with Dundee’s Exscientia.) Dr Sarangarajan, who told The Pharma Letter that another major deal with a pharma giant will be announced “probably within a month,” argues that "the current paradigm to drug discovery isn't working, and we need a different approach." He says: "When you convert large volumes of biology into data, you're looking at trillions of datapoints. It's easy to do a statistical differential, but then we would be no better than anybody else." "Our goal is - how can we use the cardinal scientific facts associated with a disease to model it, convert it into data, and find out what the model is telling us**." The big three** The potential for conflict between the pharma establishment and the new wave of digital companies is heightened by the sheer scale of the modern tech industry. The big three - Apple, Google and Amazon - have a combined market capitalization of around $1.9 trillion, larger than the top ten pharmaceutical companies put together. **Google and Apple have made direct ventures into the life sciences sector**. *Apple, Google and Amazon - have a combined market capitalization of around $1.9 trillion.* Apple has invested heavily in digital health, with software for consumers and healthcare professionals designed to leverage the company's range of hardware platforms. Observers have long-noted **the potential of Apple’s wearable technologies in applications such as blood glucose monitoring, fitness tracking, or improved safety monitorin**g. The company introduced ResearchKit in 2015 and CareKit in 2016, open source platforms designed to allow developers to build apps for research and for consumer health. These tools have used to **create[d] a range of apps, including**[**a project**](https://www.pennmedicine.org/news/news-releases/2017/january/penn-medicine-launches-first-apple-researchkit-app-for-sarcoidosis-patients)**at the University of Pennsylvania for the rare disease Sarcoidosis, and**[**another**](https://www.med.unc.edu/psych/wmd/research/postpartum-depression-research)**at the University of North Carolina which studies postpartum depression**. Meanwhile, Californian rivals Google has founded [Verily Life Sciences](https://verily.com/) to translate data science and the manipulation of big data into health technologies. Verily [partnered last year](https://www.thepharmaletter.com/article/gsk-and-google-parent-form-bioelectric-meds-company) with GlaxoSmithKline to found a new company, Galvani Bioelectronics, injected with up to $700 million, to research, develop and commercialize new bioelectric medicines. Verily is also conducting doing longitudinal research, investing $100 million-plus in the Baseline Project, a multi-year initiative mapping human health that it says will search for clues to predicting heart disease and cancer. While tech companies may not be founded with an intention to enter the life sciences space, adaptation is in the DNA of Silicon Valley, and once a certain critical mass is reached, anything is possible. Amazon, not normally associated with the pharma space, is now widely expected to be planning a move into [pharmaceuticals retailing](https://www.thepharmaletter.com/article/middlemen-jittery-as-amazon-extends-creepers-toward-pharma). The company appears adept at causing widescale disruption in whichever market it turns its attention to. When the firm recently [acquired](http://www.bbc.co.uk/news/business-40306099) US supermarket chain Whole Foods, pharmacies shed about $10 billion in share price value, according to UBS, as nervous investors saw the potential for encroachment in that area. Disruption in this market would have unpredictable consequences on drug pricing. Whatever the long-term impact of big tech on big pharma, **it’s clear that the two worlds will continue to collide long into the future**. As erstwhile Teva CEO Yitzhak Peterburg says, companies “need to think about where to invest and how to invest, and what is the right time to jump into the water."

**Green tech is key to solving climate change and the global climate crisis. Green Journal 21**

Published Feb, xx-xx-xxxx, "Why We Need Green Technology," Green Journal | News about green energy, https://www.greenjournal.co.uk/2021/02/why-we-need-green-technology/, 8-29-2021 //WHS-AC

From [electric scooters](https://www.mearth.com.au/) to using green appliances, green tech has tapped on a range of sectors to help the environment. However, green tech’s growth is not surprising, given that it is the **solution to overcoming current environmental challenges**, such as **global warming, greenhouse gases, and wildlife conservation,** among others. Green technology aims to **replace materials**, processes, or products that harm the environment with solutions that do not disrupt or deplete natural resources. However, do we really need green technology? Doesn’t technology already harm the environment? On the contrary, technology provides solutions when used correctly and properly. So, here are the reasons why we need to implement them more than ever. Reduces carbon emissions In the UK alone, the transportation sector produces [28 per cent](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/862887/2018_Final_greenhouse_gas_emissions_statistical_release.pdf) of the country’s greenhouse gas emissions, and it is the largest contributor of harmful gases. These include emissions from cars, trains, planes, and ships. To **reduce the production of greenhouse gases**, using electric vehicles have become a popular and growing solution for greener transportation. One of the most popular electric vehicles used worldwide is eco electric scooters. Thanks to ride-sharing services such as Lime and Bird, the public can find available public electric scooters in Australia, the UK, the US, France, and Singapore, among others. Since electric scooters don’t need fuel, it does not emit any harmful gas. A study in Paris found that encouraging commuters to ride e-scooters **saved the atmosphere** **330 tons of carbon emissions**. To further reduce its impact on the environment, e-scooter ride-sharing services are also transforming the scooters’ lifecycle from manufacturing to recharging. Eco-friendly electric scooters are just the start of utilising electric vehicles for personal and public transport. If more people can use green tech transportation, it would reduce greenhouse gases in the atmosphere significantly, especially in the years to come. Offers a greener energy source Although the world is shifting towards renewable energy sources, **84% of the world still use fossil fuels** based on a 2019 [study](https://www.forbes.com/sites/rrapier/2020/06/20/bp-review-new-highs-in-global-energy-consumption-and-carbon-emissions-in-2019/?sh=8bb33ed66a16). Unfortunately, fossil fuels are non-renewable and will soon be exhausted, so it’s important for people to switch to greener alternatives. With green tech, people can continue to harness energy from nature through solar panels, wind turbines, dams, and geothermal wells, among many others. By using alternative energy**, fossil fuels will not be depleted, greenhouse gases will lessen, and global warming will slow down**. Aside from these, green tech also offers solutions such as green buildings, eco-friendly battery technology, and metallic foams. Moreover, researchers continue to develop new ways to generate energy using technology such as lithium-air batteries, fuel cells, and thermal energy collectors. If you want to switch to an alternative energy source, here’s how to know [what type of renewable energy is right for you.](https://www.greenjournal.co.uk/2020/04/how-to-know-what-type-of-renewable-energy-is-right-for-you/) Provides clean water Although the earth is surrounded mostly by water, only **1.2 per cent of water is drinkable.** As freshwater consumption increases, it’s estimated that [1.8 billion](https://www.nationalgeographic.com/environment/freshwater/freshwater-crisis/)people will lack drinking water by 2025. **Green technologies resolve this crisis** through innovations like the SunSpring Hybrid which filters and turns dirty water into safe drinking water. In fact, the SunSpring Hybrid can turn over **20,000 litres of dirty water** from rivers or wells into drinking water per day. Moreover, this device runs on solar panels, meaning it can work in rural areas without electricity. This makes it valuable for small communities that reside near bodies of water or that have been struck by natural disasters. Due to increased water use and climate change, lack of clean drinking water is an issue that should be addressed now, or else, it might be too late tomorrow. Conserves wildlife **Wildlife is constantly under threat** due to human activities, natural disasters, diseases, and climate change, among others. Wildlife researchers mostly **use technology to study animals in the wild.** For example, they use bio-logging and bio-telemetry to collect data on elusive animals’ behaviour, physiology, and more without interrupting wildlife and putting researchers in danger. In addition, researchers use tech to educate people, especially students, through guidebooks or virtual tour guides. Marine institutions and zoological parks also use tech to promote wildlife conservation while providing meaningful animal encounters to the public. All of these efforts to study and improve wildlife conservation will help meet conservation needs and changes. **Continuous innovative technology will help combat the changes that are happening to the ecosystem.** Shift to green tech now Ultimately, **green tech enables people to reverse the negative effects of human activities on the ecosystem**. Organisations, governments, and communities should make significant and continuous efforts to shift to green technologies and implement them on larger scales. In this way, more people can use green tech due to easy access, resulting in a significant impact to the environment in the long run.

**The ecological effects of climate change are linear and cause extinction. Sprat and Dunlop 19**

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2050: By 2050, there is broad scientific acceptance that system tipping-points for the West Antarctic Ice Sheet and a sea-ice-free Arctic summer were passed well before 1.5°C of warming, for the Greenland Ice Sheet well before 2°C, and for widespread permafrost loss and large-scale Amazon drought and dieback by 2.5°C. **The “hothouse Earth” scenario has been realised**, and Earth is headed for another degree or more of warming, **especially** since human greenhouse emissions are still significant. While sea levels have risen 0.5 metres by 2050, the increase may be 2–3 metres by 2100, and it is understood from historical analogues that seas may eventually rise by more than 25 metres. Thirty-five percent of the global land area, and 55 percent of the global population, are subject to more than 20 days a year of lethal heat conditions, **beyond the threshold of human survivability**. The destabilisation of the Jet Stream has very significantly affected the intensity and geographical distribution of the Asian and West African monsoons and, together with the further slowing of the Gulf Stream, is impinging on life support systems in Europe. North America suffers from **devastating weather extremes including wildfires, heatwaves, drought and inundation**. The summer monsoons in China have failed, and water flows into the great rivers of Asia are severely reduced by the loss of more than one-third of the Himalayan ice sheet. Glacial loss reaches 70 percent in the Andes, and rainfall in Mexico and central America falls by half. Semi-permanent El Nino conditions prevail. Aridification emerges over more than 30 percent of the world’s land surface. Desertification is severe in southern Africa, the southern Mediterranean, west Asia, the Middle East, inland Australia and across the south-western United States. Impacts: A number of **ecosystems collapse**, including coral reef systems, the Amazon rainforest and in the Arctic. Some poorer nations and regions, which lack capacity to provide artificially-cooled environments for their populations, become unviable. **Deadly heat conditions persist** for more than 100 days per year in West Africa, tropical South America, the Middle East and South-East Asia, which together with land degradation and rising sea levels contributes to 21 perhaps a billion people being displaced. Water availability decreases sharply in the most affected regions at lower latitudes (dry tropics and subtropics), affecting about two billion people worldwide. **Agriculture becomes nonviable** in the dry subtropics. Most regions in the world see a significant drop in food production and increasing numbers of **extreme weather events**, including heat waves, floods and storms. **Food production is** inadequate to feed the global population and food prices skyrocket, as a consequence of a one-fifth decline in crop yields, a decline in the nutrition content of **food** crops, a catastrophic decline in insect populations, desertification, monsoon failure and **chronic water shortages**, and conditions **too hot for human habitation** in significant food-growing regions. The lower reaches of the agriculturally-important river deltas such as the Mekong, Ganges and Nile are inundated, and significant sectors of some of the world’s most populous cities — including Chennai, Mumbai, Jakarta, Guangzhou, Tianjin, Hong Kong, Ho Chi Minh City, Shanghai, Lagos, Bangkok and Manila — are **abandoned**. Some small islands become **uninhabitable**. Ten percent of Bangladesh is inundated, displacing 15 million people. According to the Global Challenges Foundation’s Global Catastrophic Risks 2018 report, even for 2°C of warming, more than a billion people may need to be relocated due to sea-level rise, and In high-end scenarios “the scale of destruction is beyond our capacity to model, with **a high likelihood of human civilisation coming to an end**”. 22

**Unemployment CP**

**CP text: the member nations of the World Trade Organization except for the United States ought to reduce intellectual property protections for medicines**

**IPPs in the United States supplies 10s of millions of jobs, and accounts for 40% of all U.S. exports, critical in the strength of our economy. Cullen 17**

No Author, 2-20-2017, "The State of American Intellectual Property: Protecting American Jobs," No Publication, https://www.theglobalipcenter.com/the-state-of-american-intellectual-property-protecting-american-jobs/, 8-30-2021 //WHS-AC

Since our nation’s founding, intellectual property (IP) has **play[s] a key role in American economic growth**. Today, the same protections that were enshrined in our Constitution **are a source of more than 45 million American jobs** – that’s nearly one-third of the American workforce. These are the jobs created by businesses that depend on patents, trademarks, copyrights, and trade secrets. They consist of everything from manufacturing to **medicine**, from music to movies, from small businesses to large companies. In fact, a 2015 U.S. Chamber report confirmed that IP-driven jobs contribute to the local economy in every single county, in every single state. IP is at the heart of over 81 innovative and creative industries. The U.S. is also the world’s largest exporter of intellectual **property**. According to the latest U.S. Department of Commerce numbers, total merchandise exports of IP-intensive industries alone have increased to more than **$842 billion, or almost 40 percent of all U.S. exports**. This is why IP matters. Real people and real businesses depend on a strong IP system, with appropriate IP protections, to **maintain America’s competitive advantage in the global marketplace and protect American jobs**. The latest edition of the [U.S. Chamber International IP Index](http://www.theglobalipcenter.com/ipindex2017/) reflects these realities. A measure of 45 of the world’s IP systems, the U.S. is deemed the strongest overall of any other country. But it also shows some areas for improvement. Among the six categories the Index measures, American IP has begun to fall behind in two key areas: enforcement and patents. Over the last few years, the U.S. has fallen to fifth place in enforcement of our IP. To some, fifth place might not seem so bad at first glance. But when you once again consider the sheer volume of the U.S.’s IP economy, and the fact that IP industries support nearly a third of the U.S. workforce, **protection against IP infringement comes into focus as a clear battleground for protecting American jobs.** Statistics about the number of unemployed people, the period for which they have been unemployed, their skill levels, the trend in unemployment, and regional disparities in unemployment are periodically made available for policymakers so that they can interpret them and hopefully make better-informed decisions about steering the economy and countering unemployment.

**Unemployment greatly weakens the economy, high levels can lead to crisis. Picardo 20**

Elvis Picardo, 7-24-2021, "How the Unemployment Rate Affects Everybody," Investopedia, https://www.investopedia.com/articles/economics/10/unemployment-rate-get-real.asp, 8-30-2021 //WHS-AC

According to the U.S. [Bureau of Labor Statistics](https://www.investopedia.com/terms/b/bls.asp) (BLS), when workers are unemployed, their families lose wages, and **the nation as a whole loses their contribution to the economy** in terms of the goods or services that could have been produced. Unemployed workers also lose their [purchasing power](https://www.investopedia.com/terms/p/purchasingpower.asp), which can lead to unemployment for other workers, **creating a cascading effect that ripples through the economy**. In this way, unemployment even impacts those who are still employed. When companies are trying to cut costs, they often reduce their workforce as one of their cost-saving measures. Those workers who are left to do more work after a company lays off part of their staff are not likely to receive any additional compensation for the extra hours they are working. Unemployment can also have a negative effect on the mental state of those who are still employed. They may become more concerned about losing their jobs or be hesitant to search for other employment because they have a false belief that they "are lucky" to be employed at all. They may even feel guilty about having a job when their co-workers are out of work. More broadly, high unemployment is also **problematic for the U.S. economy**. Over 70% of what the U.S. economy produces is purchased by domestic consumers through their [personal consumption](https://www.investopedia.com/terms/p/pce.asp) habits.2 Unemployed workers consume far less than those with a steady income because they have less discretionary income. In order to understand the causes and the remedy for high levels of unemployment, policymakers seek information on different aspects of unemployment.

**A U.S. economic collapse would have catastrophic impacts, reverberating all over the world and changing life as we know it today. Amedeo 21**

Kimberly Amadeo, 2-4-2021, "Can the US Economy Collapse?," Balance, https://www.thebalance.com/u-s-economy-collapse-what-will-happen-how-to-prepare-3305690, 8-30-2021 //WHS-AC

The U.S. economy's size makes it resilient. It is highly unlikely that even the most dire events would lead to a collapse. If the U.S. economy were to collapse, it would happen quickly, because the surprise factor is a one of the likely causes of a potential collapse. The signs of imminent failure are difficult for most people to see. Most recently, the U.S. economy *almost*collapsed on September 16, 2008. That's the day the [Reserve Primary Fund “broke the buck](https://www.thebalance.com/reserve-primary-fund-3305671)”—the value of the fund’s holdings dropped below $1 per share.1﻿ Panicked investors withdrew billions from [money market accounts](https://www.thebalance.com/money-market-funds-3305944) where businesses keep cash to fund day-to-day operations.2﻿ If withdrawals had gone on for even a week, and if the Fed and the U.S. government had not stepped in to shore up the financial sector, the entire economy would likely have ground to a halt.  Trucks would have stopped rolling, **grocery stores would have run out of food, and businesses would have been forced to shut down.** That's how close the U.S. economy came to a real collapse—and how vulnerable it is to another one. Will the U.S Economy Collapse?  A U.S. economy collapse is unlikely. When necessary, the government can act quickly to avoid a total collapse. For example, the Federal Reserve can use its [contractionary monetary tools](https://www.thebalance.com/contractionary-monetary-policy-definition-examples-3305829) to tame hyperinflation, or it can work with the Treasury to provide liquidity, as during the 2008 financial crisis. The Federal Deposit Insurance Corporation insures banks, so there is little chance of a banking collapse similar to that in the 1930s. The president can release [Strategic Oil Reserves](https://www.thebalance.com/oil-reserves-definition-categories-world-s-largest-3305873) to offset an oil embargo. Homeland Security can address a cyber threat. The U.S. military can respond to a terrorist attack, transportation stoppage, or rioting and civic unrest. In other words, the federal government has many tools and resources to prevent an economic collapse.  What Would Happen If the U.S. Economy Collapses? If the [U.S. economy collapses](https://www.thebalance.com/us-economy-wont-collapse-3980688), you would likely lose access to credit. Banks would close. Demand would outstrip [supply](https://www.thebalance.com/aggregate-supply-what-it-is-how-it-works-3306216) of food, gas, and other necessities. If the collapse affected local governments and utilities, then water and electricity might no longer be available. **A U.S. economic collapse would create global panic.** Demand for the dollar and [U.S. Treasurys](https://www.thebalance.com/what-are-treasury-bills-notes-and-bonds-3305609) would plummet. Interest rates would skyrocket. Investors would rush to other currencies, such as the yuan, euro, or even gold. It would create not just inflation, but [hyperinflation](https://www.thebalance.com/what-is-hyperinflation-definition-causes-and-examples-3306097), as the dollar lost value to other currencies. If you want to understand what life is like during a collapse, think back to the [Great Depression](https://www.thebalance.com/the-great-depression-of-1929-3306033). The stock market crashed on Black Thursday.3﻿ By the following Tuesday, it was down 25%. Many investors lost their life savings that weekend.  By 1932, one out of four people was unemployed.4 Wages for those who still had jobs fell precipitously—manufacturing wages dropped 32% from 1929 to 1932.5﻿ U.S. gross domestic product was cut nearly in half. Thousands of farmers and other unemployed workers moved to California and elsewhere in search of work. Two-and-a-half million people left the Midwestern Dust Bowl states.6﻿ The Dow Jones Industrial Average didn't rebound to its pre-Crash level until 1954.