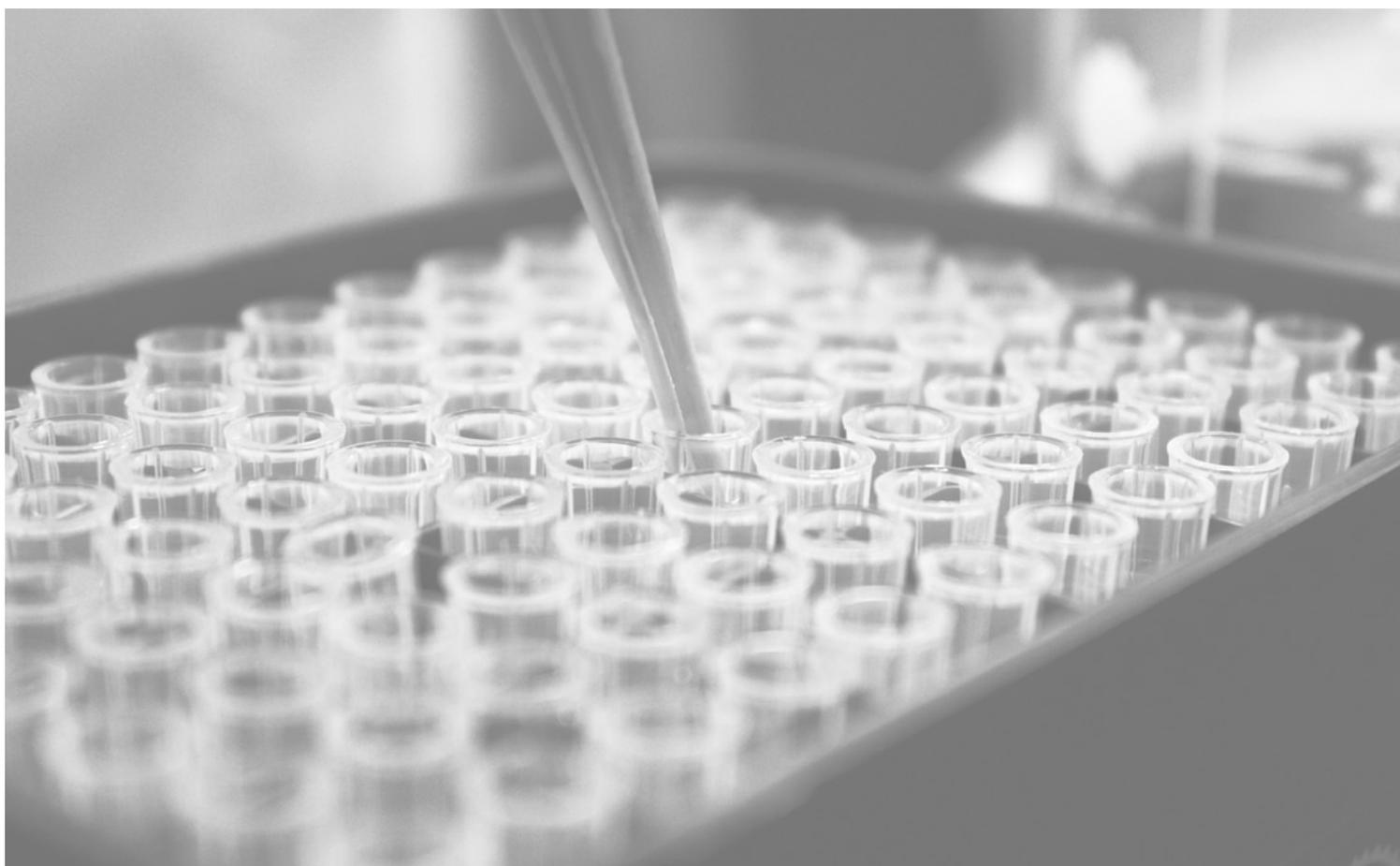


Democratising Knowledge: Transforming Intellectual Property and Research and Development



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Executive Summary

The current public health crisis is demonstrating how deficiencies in our approach to intellectual property (IP) – a unique set of rights and protections that applies to the creations of the human intellect – and research and development (R&D) imperil the health, safety, and livelihoods of millions of people around the world. As has happened all too often in the past, the choice to prioritize corporate profits and an exclusionary version of IP rights and R&D over affordable medicines and medical supplies is proving not only to be deadly, but also threatens to dramatically increase economic, geographic, and social inequality.

While originally intended to stimulate innovation by protecting ownership of knowledge and creativity, the current approach to IP has increasingly become a driving force for the accumulation and protection of assets by a narrow set of multinational companies and elite interests. Moreover, the incredible rise of intangible assets such as IP rights has become a defining feature of contemporary, financialized capitalism and a crucial source of control in an economy that increasingly values data, brands, algorithms, and proprietary software.¹

This current approach has resulted in sluggish rates of innovation, increasing economic and racial inequity, and reductions in competition, among a host of other deleterious outcomes. Because of this, calls for IP reform are becoming increasingly common across the political spectrum.

Relatedly, R&D has increasingly been directed towards private interests and private profit in recent decades, resulting in reduced public spending on R&D as a percentage of GDP, the creation of a system of double taxation whereby consumers pay for public investments in innovation and then again through excess costs for products and services, and a reorientation of R&D spending (both public and private) towards maximising profits, rather than alignment with pressing social, economic, and ecological needs.

The rationale driving this approach to IP and R&D is that private ownership, market forces, and profit (supported by public subsidies and tax breaks) incentivises innovation and efficient resource allocation, stimulating economic growth and job creation. But this does not stand up to evidence. Instead, by allowing these critical systems to primarily benefit private interest and corporations, we are failing to equitably develop and distribute products and services, adequately compensate workers and taxpayers, and maximize and stimulate innovation to address the intensifying and intersecting crises we now face.

In place of this, we need a new approach to the conceptualisation, design, and implementation of IP and R&D; one that recognises how critical these interconnected and entwined systems are to building a more equitable, sustainable, and democratic 21st century economy.

To do so, we recommend extending and embedding principles of democratic public control and ownership over IP and R&D, as well as reforming corporate

behaviour, to reverse encroachment and expand the public commons. This includes:

- Moving towards a public knowledge commons approach to IP rooted in the principles of public ownership and equitable access;
- Ensuring that publicly-developed IP is held for the public benefit;
- Increasing public research and development (R&D) with a focus on public benefit, addressing the intersecting economic, social, and ecological crises we now face, and confronting increasing global threats to humankind (such as climate change);
- Challenging corporations and monopoly power by linking public ownership and control of IP and R&D with efforts to increase competition in various economic sectors and diversify the ownership structure of enterprises and services (including cooperatives, publicly owned enterprises, and sustainable local and regionally based companies);
- Boosting workers' rights and empowerment by giving workers a voice in new IP and R&D systems and institutions and removing IP rights and protections from companies that abuse workers;
- Centering global solidarity and reparations (including technology transfers) to acknowledge and redress the role of the US and UK in extracting wealth, knowledge, and resources from the rest of the world (primarily the Global South) through centuries of colonialism, enslavement, and imperialism.

In order to see these principles embedded, we suggest a series of policy proposals that can guide a new approach to IP and R&D in the UK and the US.

First, we need to grow public investment in socially and environmentally beneficial research and development to meet the needs of the future. This must entail reversing the declines of recent decades (relative to GDP) and increasing public R&D investment to around 2% of GDP or more over the next ten years. While large, such an increase is necessary to confront the intensifying crises we now face, such as climate change, within rapidly shrinking time frames for action. Moreover, in addition to spurring innovation and sustainable economic development, it could also reduce consumer costs and increase public health and wellbeing, all of which would provide a return on investment that far outweighs the additional expenditures.

However, where this investment is channelled and who it impacts and benefits is critical. Public spending on R&D isn't necessarily always in the public interest, and is sometimes championed by corporations to bolster private profits (e.g. corporations sometimes advocate for greater public spending on early stage R&D so that it can be appropriated and leveraged down the road for private gain). Boosting R&D investment in a way that promotes equity, sustainability, and democracy will require an overhaul of our tax systems (such as reducing cross-border tax competition and ending tax avoidance schemes), the establishment of new institutions (such as the creation of a public investment bank or a series of national and regional investment banks, through which public investment in R&D could be channelled to grow innovation), and the development of a broader industrial/economic strategy that focuses on securing ecological sustainability, nurturing alternative models of ownership, and reducing corporate concentration and power.

Second, we need to also ensure that intellectual property serves the common good, with a mission orientated and common ownership approach. Structured appropriately, IP can

help stimulate innovative ideas and products to address today's interconnected crises, from developing affordable access to medicines to driving technological advances to meet the climate crisis challenge. Strengthening and formalizing public interventions and regulations could go some way to alleviating the pricing and usage problems that plague the IP and R&D systems. For instance, we should link the granting or continuation of IP protections, as well as public R&D investments, to certain public good standards (such as tax justice, population health, equitable access to medicines, and workers' rights).

Third, we need to grow the public stake in creations of the mind through the development of publicly owned and democratically governed IP Commons entities. Building from some emerging precedents around the world, these entities would begin to shift us from an innovation system based on enclosure and competition to one that centers principles of cooperation and greater pooling and sharing of the risks and rewards of IP. Strategies to build these IP commonses could include: requiring that IP generated from publicly funded R&D be put into the commons (either immediately or after a short period of exclusivity); requiring that IP revoked from or denied to private corporations due to labor or public good abuses be put into the commons; and / or shortening the length of exclusive use of IP protections grants and transitioning that IP to the commons after expiration. These publicly owned common entities, or IP pools, could, depending on the circumstance, operate on a licence model, an open-access model, or perhaps most likely, a combination of both.

One of the keys to the challenge of reimagining R&D is the need to reorient the role of the state from one reduced to correcting market defects, subsidizing and supporting economically and politically powerful business interests, and intervening to prop up private businesses and profits when the market system slips into crisis, to one involved in actively and proactively shaping and determining output and innovation that is in the public interest. Governments at various scales (local, regional, national, or federal, as appropriate) could draw from domestic and international examples and create publicly funded and managed venture capital funds to invest and manage shares in private firms – especially start-up ventures, companies experimenting with new and innovative technologies, and enterprises in strategically important sectors (such as renewable energy and climate change mitigation). Such a network of public VC funds would both support a more mission-orientated state and enable the gains of high-risk, high-reward investment to better return to the public.

At the heart of these reforms to IP and R&D is the goal to confront and challenge corporate power and its effects on workers and communities across the world. For instance, as we navigate the difficult landscape of COVID-19, the power and control exerted by pharmaceutical giants has become increasingly evident. Similarly, addressing the looming threat of catastrophic climate change has for decades been stymied at every turn by the concentrated power of fossil fuel corporations and their financial backers. We need strengthened powers of intervention for the public to gain control over critical economic sectors and institutions. This includes, for instance, control over drug pricing and the ability of governments to step in and produce generic drugs to ensure that nobody is left without access to medicines. To that end, in addition to the other suggestions around ownership, control, and regulation of IP, we recommend the creation of one or more publicly owned pharmaceutical and manufacturing entities in the UK and US to not only control the cost of drugs domestically, but safeguard affordable medicine internationally through technology transfers and open access to medical and pharmaceutical research.

Many of the challenges and crises we face are global in nature and will only be solved through genuine international cooperation based on solidarity and reparations for centuries

of extraction and exploitation. Among many other things, this requires technological transfers, which goes far beyond simply making it slightly more affordable for low and middle income countries to purchase products and services owned and controlled by large corporations headquartered in the Global North. Rather it should involve removing IP restrictions on certain critical innovations and overhauling the pro-corporate, pro-enclosure IP rules and systems that predominate in international free trade agreements and institutions to support economic development, ecological sustainability, public health, self-determination, and poverty alleviation in the Global South. Here, we recommend drawing on the need for (and increasing discussion of) a global pool of COVID-19 response technologies, which would allow for the compulsory sharing of intellectual property, data, and know-how relating to medicines and vaccines during a health emergency as an illustration of how this could be developed.



Introduction & Defining Intellectual Property

Earlier this year, amidst a global frenzy to develop vaccines and treatments to deal with the COVID-19 pandemic, a tiny pharmaceutical company in the US made headlines when it sold the rights to a promising antiviral therapy to the giant drug company Merck. What made this sale controversial is that the small company, Ridgeback Biotherapeutics (owned by hedge fund manager Wayne Holman), had only recently licenced the drug from Emory University, where it had been invented thanks to \$16 million in public funding. Around the same time, the large corporation Gilead caused an uproar when it sought and received “Orphan Drug” status for the drug remdesivir (also developed largely with public funds), which had shown some limited promise in treating COVID-19. The new status would have allowed Gilead to bar efforts to create generic versions of remdesivir for seven years, and drew such widespread condemnation and bad publicity around the world that the company quickly reversed course.² These episodes, and numerous others like it both during and before the pandemic, have shone a bright spotlight on the question of who benefits from our current system of intellectual property (IP) and research & development (R&D).

For instance, as of the end of June, some of the largest and most profitable pharmaceutical companies had added more than \$50 billion to their market value during the pandemic, based largely on hype around unproven treatments and vaccine candidates.³ At the same time, according to the World Health Organization (WHO), at least half the world's population lacks access to essential health services and technologies even in ordinary times, due in large part to cost-related access barriers.⁴ Furthermore, as the African Union expressed in a recent communiqué, IP rights have often hindered “timely introduction of affordable vaccines in developing countries.”⁵ Maintaining the status quo with respect to IP rights during this crisis is thus expected to exacerbate stark existing health, economic, and racial inequalities.

In essence, IP is now the commonly used term to refer to a government-granted right to monopolise and utilise certain information. In the words of the World Intellectual Property Organization (WIPO), IP refers to “creations of the mind.”⁶ However, applying a “property” framework to knowledge in this way is both relatively new in human history and controversial. “Use of the word ‘property,’” the Electronic Frontier Foundation writes, “can mislead lawyers, judges, policymakers, and interested citizens into thinking that copyrights, patents and trademarks should be treated like real property” whereas, in reality, it is a “very special kind of ‘property’” perhaps more accurately described as a system of rights and privileges.⁷

Moreover, EFF continues, the term “intellectual property” deliberately obscures very real differences between particular legal regimes and claims – and in particular allows certain concepts, such as trade secrets and industrial designs, to be cloaked in the “perceived legitimacy of the three ‘core’ legal areas” (patent, copyright, and trademark law). As such, in this paper, we endeavour to use the terms “IP rights” or “IP protections” as often as possible

to highlight the unique nature of this type of “property.”

While the specific nature and definition of IP differs depending on location and interpretation, in the modern economy it is ubiquitous and shapes, to varying degrees, how ideas, inventions, and work is used and conveyed. It also directly influences how products are recognised by both society and the market.⁸ Some of the core components and definitions commonly associated with “intellectual property” include:

- Patents: rights to hinder inventions from being commercially used, distributed, imported, or sold without the permission of the inventor or patent holder.
- Copyright: the legal terminology applied to the rights held by creators over expressions of literary or artistic work, such as compositions of music, adverts, books and movies. It is often also applied to the rights creators have over computing software. The scope of copyright is expansive, ranging from the economic right of the owner to authorise or prevent certain uses in relation to work, to the right to claim authorship over work.
- Trade secrets: rights on private information that can be sold or licensed, such as commercially viable information or information known only to a group of persons. Illustrations of trade secret-based violations include everything from breach of contract to commercial espionage.
- Trademarks: signs that differentiate goods or services of one enterprise from those of others, ranging from combinations of letters, to symbols, to colour shades.
- Industrial design: which establishes the ornamental aspect of an article. It involves an extensive variety of industries, such as arts and creative, and encompassing three-dimensional features like the shape of an article or two-dimensional features, such as colours.
- Geographical indication: a mark placed on products that have a precise geographical origin and retain makings or a reputation due to that origin.

The incredible rise of intangible assets, such as IP, is a key source of value and control in contemporary capitalism. This is demonstrated by the growth of key players in the tech industry whose products do not exist in three-dimensional spaces but are instead founded on brands, data, and algorithms. “Digital technologies have enabled the emergence of an ‘intangible economy,’ based on soft assets like algorithms and lines of code, rather than physical assets like buildings and machinery,” Zia Qureshi writes. “In this environment, intellectual-property rules can now make or break business models and reshape societies, as they determine how economic gains are shared.”⁹ A classic example is the case of farmers in the United States who have been in a protracted battle with the farm equipment company John Deere over the right to repair their own tractors and other machinery.¹⁰ Deere (and many other corporations, including Apple and Ford) use existing copyright laws to prevent users from accessing, repairing, or modifying the increasingly complex software that is at the heart of modern devices and machinery.

While originally intended to protect ownership of knowledge and creativity, IP has increasingly become a driving force for the control and ownership of assets. For instance, in the United States, the Patent and Trademark Office (USPTO) took 155 years to issue its first 5 million patents, and just 27 years for it to issue the next 5 million, but there’s little evidence of a great explosion of exponential innovation in that 27 year period.¹¹ “Since the early 1980s, the number of patents registered with the USPTO has more than quadrupled,” Sean D. Harding

writes. “However, this growth has not coincided with any recognizable increases in the level of innovation in the U.S. economy.”¹² Rather, this rise is due, at least in part, to the increasing ease of securing patents along with the rise in patenting minor modifications to existing inventions.¹³

The rationale behind the current approach to IP often contends that allowing and extending private property rights and exclusivity over information is a more efficient way of incentivising innovation and allocating resources than public planning and production.¹⁴ Indeed, focusing on intellectual property rights as the chosen means of incentivising scientific and cultural production, as Amy Kapczynski argues, has “been so deeply internalized in the field of IP law that it is typically taken for granted.”¹⁵

However, knowledge is inherently a public good and this current approach has increasingly led to IP protections being used to primarily benefit private interests – allowing corporations to extract immense profits while not necessarily maximising innovation, delivering an equitable distribution of its products (domestically or internationally), or adequately compensating the public and the workers involved in the funding and creation of R&D. As Joseph Stiglitz, Dean Baker, and Arjun Jayadev write, “an increasingly dense ‘patent thicket’ in a world of products requiring thousands of patents has sometimes stifled innovation, with more spent on lawyers than on researchers in some cases. And research often is directed not at producing new products but at extending, broadening, and leveraging the monopoly power granted through the patent.”¹⁶ While this is particularly true for the pharmaceutical drug sector, it also holds in other sectors as well. For instance, as Stiglitz, et.al. write “in fields such as information technology, a whole set of weak patents and an epidemic of over-patenting has made subsequent innovation difficult and has eroded some of the gains from knowledge creation.”¹⁷

The IP owned by a conglomerate corporation such as Alphabet offers an insight into how the various forms of intellectual property can be subjected to corporate capture and private gain to the detriment of the common good. Google’s search algorithm, for example, is protected by trade secrets and other IP protections even though its development was financed by the taxpayer funded National Science Foundation.¹⁸ Moreover, the mountains of data the company collects are also protected (as is even basic information on physical assets like data centers and servers). And despite publicly-funded knowledge leading to immense profits for the company, in 2017 Google moved 19.9 billion euros (\$22.7 billion) through a Dutch shell company to Bermuda, effectively shifting revenue from royalties earned outside the United States to Google Ireland Holdings, an affiliate based in Bermuda, where companies pay no income tax.¹⁹

The implications of IP enabled corporate consolidation and power on our lives are wide-ranging. For instance, several of Google’s patents filed during its early years established a precedent for new approaches to corporate data collection, the ramifications of which have been far reaching. As Shoshana Zuboff describes, these patents “illustrate the explosion of discovery, inventiveness, and complexity detonated by the state of exception that led to these crucial innovations and the firm’s determination to advance the capture of behavioral surplus.”²⁰ This process solidified the broader evolution from corporate mining of behavioural data with the objective of enhancing user experience to transforming “private human experience as free raw material that can be computed and fashioned into behavioural predictions for production and exchange.”²¹

Moreover, this example highlights another major deficiency with the IP system as presently structured. Namely that, while most major “advances” in innovation and R&D are built off wider public knowledge systems – including public infrastructure, legal systems, and state-led investment and research – the public retains little to no ownership or control. This

includes everything from iPhones to pharmaceutical drugs to renewable energy and beyond.²²

For instance, the U.S. National Institutes of Health (NIH) spent nearly \$700 million on coronavirus R&D before the current pandemic, and Congress has appropriated another \$10 billion in additional funding for the development and production of vaccines, therapeutics, and diagnostics since the COVID-19 pandemic began.²³ With no access provisions conditioning these grants, private corporations will be allowed to charge whatever they wish for the products developed with these public funds. Additionally, the IP protections (and the market advantages these confer) on the data and methods developed as part of this publicly-funded research encourage companies not to share information that is vital to the safe and efficient development of vaccines and treatments for COVID-19.

More generally, as many scholars have demonstrated, much of the economic gain and technological innovation in our modern society is due to a collective inheritance from the past (or, put differently, a gift from society). “The gift of the past includes thousands of years of accumulated knowledge and technology — arithmetic, calculus, electricity, chemistry, physics, automobiles, airplanes, engines, computers, the internet, modern medicine, and on and on,” Gar Alperovitz writes.²⁴ While varying in different places, with some jurisdictions doing a better job of centering public interest and common good, the IP and R&D systems currently in place in many societies, including the United States and United Kingdom, acts primarily to cement and preserve exclusive private control over, and profit from, technologies, processes, and ideas that are, to varying degrees, derived from vast quantities of accumulated public and social investment and knowledge.

In sum, the current IP and R&D systems are increasingly being understood as a potential impediment to the development of a thriving, innovative, and equitable 21st century economy.²⁵ This growing realization has led, in recent years, to a proliferation of alternative proposals and designs. These can generally be grouped into three broad categories:

1. Reforming existing laws and approaches.

This can include: changing the legal regime around patents and other IP such that they cannot be used primarily to stifle competition and innovation; reducing the length of patent and copyright terms; limiting the types of inventions and innovations that can receive IP protections; restricting patents to processes rather than products; and/or removing IP protections if the invention or product is not being utilized (or is being underutilized).

2. Asserting public control.

This primarily refers to using government authority to ensure that IP protections do not hinder important public goals and ensuring that the public benefits from any and all inventions, innovations, and products that are developed with public resources or support. The former may include approaches like compulsory licensing, which allows governments to bypass IP restrictions, and laws such as 28 U.S. Code § 1498, which “gives the government the right to use patented inventions without permission, while paying the patent holder ‘reasonable and entire compensation’.”²⁶

In terms of the latter, as Qureshi puts it, “governments should consider how to give taxpayers a stake in such profitable outcomes from publicly supported research, not least to replenish public R&D budgets.”²⁷

In practice, this can range from laws (like the Bayh-Dole Act in the United States) that regulate how private sector patents derived from publicly-funded research can be used and how the government can apply for and use patents (discussed further below), to revenue sharing formulas, to requirements that publicly-funded research cannot be afforded IP protections and must be made available to all. Depending on how narrow or wide one sets the definition of public support, such regimes could be limited or apply quite broadly (perhaps even universally). Such an approach is often combined with, or thought of in correlation with, an increased role of direct public funding in the R&D process.

3. Establishing commons-based approaches.

These proposals suggest a fundamental rethinking of the values and principles underpinning the IP and R&D systems, and moving away from enclosure and exclusivity towards greater levels of openness and collaboration. “The privatization and patenting of knowledge and technical solutions hampers the widespread distribution of necessary innovations,” Michel Bauwens writes. “No such impediments exist in the open contributory systems of peer production communities, where innovation anywhere in the network is instantly available to the whole.”²⁸

Such approaches, while still small in relation to traditional approaches to IP and R&D, are generating increased interest around the world, especially in light of the COVID-19 pandemic.²⁹ For instance, the World Health Organization has recently launched a voluntary patent pool to collect and share information that will be useful to developing vaccines and treatments for COVID-19.³⁰ This is similar to other patent pools that have been established in recent years, including the Medicines Patent Pool (MPP) which works to ensure that drugs for diseases like HIV and Malaria are available to less well-resourced countries. The success of the MPP and open science projects like the Structural Genomics Consortium – which determines the three-dimensional structures of proteins of medical relevance and puts them in the public domain – give a sense of the potential impact for scientific endeavours undertaken in the public interest.

Many of these strategies are not necessarily mutually exclusive, and IP and R&D reform advocates often articulate a differentiated or phased approach. This could include, for instance, different IP regimes for various economic sectors or implementing certain reforms and changes in an incremental manner. One thing is certain, as we seek to rebuild our economies following the COVID-19 pandemic and develop the 21st century digital economy, rethinking intellectual property and research and development so that they are centred on equity, innovation, and sustainability should be fundamental and central.



IP and R&D in the UK

In the UK, the Intellectual Property Office (IPO) is the government body responsible for intellectual property rights.³¹ The IPO acts as an executive agency, sponsored by the Department for Business, Energy and Industrial Strategy (BEIS) and supported by a public body, the Company Names Tribunal. The IPO “is responsible for monitoring and enforcing compliance with the Collective Management of Copyright (EU Directive) Regulations 2016 (the Regulations).”³²

Service Standards apply to bodies regulated by the IPO that are involved in the collective licensing of copyright works, such as collective management organisations (CMOs), their right holders, and external parties such as users.

Licensing bodies are used to describe an organisation offering licences for the use of copyright work.³³ A collective management organisation (CMO) is a form of licensing body, which is typically a not for profit organisation owned and controlled by members, that permits IP rights on behalf of multiple rights holders in a single license for a single payment.

Intellectual property laws are largely harmonised throughout Europe, but, under the EU Withdrawal Act, the existing body of directly applicable EU law will be converted into domestic law. Because “the UK would no longer be a Member State, this would affect the unitary character of EU IP rights, meaning that they would not be protected in UK law.”³⁴ As the IPO notes³⁵, the Withdrawal Agreement “ensures continued protection of existing EU-level IP rights in the UK after the end of the transition period.”

While much of the administering of IP serves to enclose private control over creations of the mind, it is often the case that such exclusivity rights are generated not only by the state at an administrative level but through public investment.

In the UK in 2018, total expenditure on R&D was £37.1 billion – the equivalent of 1.7% of GDP. R&D investment has risen over the past few decades in the UK, from £18.5 billion in 1981 to the current total of £37.1 billion (in 2018 prices). This amounts to a real terms increase of 101%. However, as a proportion of GDP, it has fallen over this period. It was, for example, the equivalent of 2.0% of GDP in 1981.³⁶

The business sector is the single largest funder of R&D in the UK at around 68% of the total. And while the proportion of R&D funded by the government has dropped, from 42% in 1985 to 26% in 2018 (including the research councils and the HE funding councils), the proportion of R&D funded by business has increased from 47% in 1985 to the 2018 total of 55%. The industry in the UK that performed the highest levels of R&D in 2018 was the pharmaceutical sector, coming in at around £4.5 billion, while the automotive manufacturing sector carried out the second most R&D at £3.8 billion. AstraZeneca was the highest funding R&D UK company in the 2018-2019, with companies such as GlaxoSmithKline, HSBC, and Rolls-Royce following. It is noteworthy that the two highest funding R&D UK companies are pharmaceutical giants.

There are three main funders of R&D in the public sector: The Government, the research councils, and the higher education funding councils. The government has increased its

spending on R&D slightly to £3.8bn.³⁷ Analysis of ONS data³⁸ shows that direct public sector spend on R&D has remained substantial but stable at around £9bn.

There are a range of public bodies and organisations supporting R&D throughout the UK. UK Research and Innovation (UKRI), a non-departmental public body funded by a grant-in-aid, encompasses Innovate UK, seven research councils, and Research England. Innovate UK connects and funds businesses to support innovation throughout the UK, investing £2.5 billion since 2007.³⁹ The seven councils overseen by UKRI include the Economic and Social Research Council and the Medical Research Council. Moreover, Research England provides grants to English universities for research and knowledge exchange activities and oversees the management of the £900 million UK Research Partnership Investment Fund and administering the Higher Education Innovation Fund. Distinct bodies exist in Scotland, Wales and Northern Ireland, such as Scottish Enterprise, a non-departmental public body of the Scottish Government that is a national economic development agency delivering innovation funding.

Aside from administering and regulating IP, as well as supporting it directly via R&D investment, the revenue forgone from R&D tax credits and Patent Box relief amounted to over £5.4bn in 2017-18.⁴⁰ However, in terms of strengthening a resilient and equitable industrial strategy, the current approach falls short, by, for example, primarily channelling funding to large companies, further solidifying their power.⁴¹

The Patent Box, for example, was introduced in the Finance Act 2012, having been announced in the 2010 Corporate Tax Roadmap.⁴² It applies a lower rate of Corporation Tax (10%) to profits attributable to patents and equivalent forms of intellectual property, and is designed to “encourage companies to keep and commercialise intellectual property in the UK” by allowing “companies to apply a lower rate of Corporation Tax to profits earned from its patented inventions.”⁴³ HMRC figures published in 2019 reveal that from 2016-17, 1,170 companies claimed relief under the Patent Box.⁴⁴

Of the companies that claimed relief through the scheme, around a third were classified as large companies. Large companies here are categorised as having a turnover of over EU50 (£45.68) million, total assets in excess of EUR43 (£39.28) million, and over 250 employees. These large companies accounted for the vast majority of support, claiming an astounding 95% of the total relief claimed.⁴⁵

Regional disparity also exists in the Patent Box scheme, with the highest number of reliefs issued in the South East (17%) and the lowest in the North East (just 3%) in 2016-17.⁴⁶ Regional imbalances furthermore exist in the total value of relief claimed under the Patent Box, with companies in London claiming more than half of the total relief in 2016-17. Moreover, the Patent Box scheme has been shown to be poorly targeted to incentivise research and concerns have been raised around the scheme incentivising tax competition without providing benefits.⁴⁷

Patent applications also highlight broader inequalities in our society. While there has been an increase in the proportion of female inventors, from less than 4% in the early 1980s to over 8% in recent years, the gender patent gap remains stark.⁴⁸ This divide is even more prevalent when what is being patented by female applicants is considered. Between 2000-2015, female inventors in the wearing apparel sector ranged between 30.4-55.5%, however these figures dropped to 0.9% for steam generation, for example.

Moreover, the R&D tax credit scheme has been shown to produce a deadweight loss through subsidising investments that would have occurred regardless. Research by IPPR suggests that on average, “80 per cent of additional R&D spending among firms using the large company scheme in 2015/16 would have gone ahead without any government subsidy,

while deadweight loss in the deductible and payable credit versions of the SME scheme was between 57 and 67 per cent.”⁴⁹

Compounding this is the risk of a deregulated race-to-the-bottom Brexit imperilling the protection of areas such as food trademarks and the ongoing US-UK trade deal placing the NHS in jeopardy. Securing “intellectual property rights that reflect a standard of protection similar to that found in US law” could, for example, result in forms of exclusivity that will increase the prices the NHS will have to pay for drugs. As the UK lead negotiator noted: “The impact of some patent issues raised on NHS access to generic drugs (i.e. cheaper drugs) will be a key consideration going forward.”⁵⁰

The timing of such developments matter, as problems related to IP in public health long predate the current public health crisis. Specifically, the pharmaceutical industry is of vital strategic importance to both public health and to the economy in both normal and extraordinary times. In the UK, the pharmaceutical industry receives substantial public investment and subsidies. For example, the government funds a network of institutions which support the medical innovation of researchers and companies, spending £2.4bn on health-focused research and development in 2015.⁵¹ But the current incentive system for drug development is “failing to deliver optimal health outcomes”, instead channelling focus towards inefficient routes to drug development driven by profits rather than societal needs.⁵²

At precisely the moment we should be looking to reimagine the governance and regulation around pharmaceutical innovation as we face a public health crisis, we are moving towards a model that doubles down on some of the worst elements of the status quo. As Brown, Chow, Hanna, and McDonald, note: “we have a public healthcare system that relies on privatised medicines (developed with public support) that are developed for the areas of greatest financial return rather than the areas of greatest public health need.”⁵³

IP and R&D in the US

The U.S. intellectual property system is not dissimilar from the UK’s, due in large part to its historical roots in 17th and 18th century English law. The U.S. Copyright Act of 1790, for instance, was based directly on the English Parliament’s 1710 Statute of Anne.⁵⁴ Though the colonies each developed their own intellectual property rules, the federal government is now the primary source for IP law in the U.S. and Congress’s right to “promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries” is enshrined in the Constitution.⁵⁵

This IP system has evolved significantly over the years and grown in complexity in response to technological advances and industry lobbying. One of the most consequential changes to the IP regime in modern times occurred with the 1980 passage of the Patent and Trademark Law Amendments Act (more commonly referred to as the Bayh-Dole Act). Prior to the enactment of Bayh-Dole, government-funded research breakthroughs were either owned

by the state agency that funded them or placed in the public domain. But Bayh-Dole allowed for these inventions to be patented and for those rights to be transferred to private entities, contributing to what some have called the “tragedy of the anti-commons” in which many are forced to underuse resources because owners of IP rights can block others’ use of those resources.⁵⁶

While Bayh-Dole had both the intention and effect of essentially privatizing publicly-funded inventions and technology, it did allow the government to retain certain control rights. This includes a “nonexclusive, non transferable, irrevocable, paid-up license” to use the technology or invention for its own purposes. It also allows the government “march-in” rights to force the patent holder to grant a “nonexclusive, partially exclusive, or exclusive license” to another party (and if they refuse, the law allows the government to issue the license itself).⁵⁷ However, as of yet, the US government has never used the march-in rights afforded to it under Bayh-Dole and rarely, if ever, uses its paid up licence rights, despite obvious access and affordability issues related to publicly-funded inventions and technology, especially medicines.⁵⁸

Despite the increasing privatization of the results of public R&D, the National Institutes of Health (NIH) remains the single largest public funder of biomedical research in the world and its contributions to R&D are equivalent to more than half of the annual R&D spend of major pharmaceutical companies. Numerous other federal and state agencies including the Department of Defense, the National Science Foundation, the Department of Energy, and various state-run initiatives for stem cell and cancer research also make significant ongoing contributions to the R&D that forms the basis of much of the country’s scientific innovation.

In addition to mounting questions about the efficacy of the IP system in incentivizing innovation in the US, there is increasing concern that this body of law is protecting private and elite interests and contributes to rising inequality. For instance, research by Colleen Chien shows that more than 50% of new patents are issued to just the top 1% of grantees (up from 38% in the mid-1980s). Moreover, Chien’s research also shows that the share of patents held by small companies continues to fall, down to 28.5% in 2015.⁵⁹

One of the primary methods used by large corporations to extract incredible rents from the US IP system is through numerous “defensive patenting” and “patent gaming” techniques that prevent market competition.⁶⁰ Defensive patenting is the strategy of amassing a large portfolio of patent protections without necessarily intending to assert or enforce those negative rights associated with the patents, thus monopolizing a whole market space and protecting against suit from other inventors. This strategy is prevalent in many sectors (including computer software and hardware), but shows up clearly – and nefariously – with regards to medicines and medical technologies on the US market, where across the top 12 highest grossing drugs, there’s an average of 125 patent applications, 71 patents granted, and 38 years of market exclusivity.⁶¹

“A majority of patents,” Quereshi writes, “are used not to produce commercial value, but to create defensive legal thickets that can keep potential competitors at bay. As the system expands, patent trolling and litigation soar. Lawsuits by patent trolls comprise more than three-fifths of all lawsuits for IP infringement in the U.S., and cost the economy an estimated \$500 billion in 1990-2010.”⁶² Thus, in the US system, huge amounts of resources that could be used to further innovation or provide more equitable access to its fruits are instead funnelled into activities that function to prevent innovation and competition by conferring ever greater protections on existing products.

Additionally, as corporations – such as large pharmaceutical companies – have begun to store more and more of their “value” in IP, they have been incentivized to financialize to such

a degree that they often downsize human resources, sell off equipment and other assets, and pursue numerous other cost cutting measures in order to pay dividends to shareholders, all of which further hampers their ability to innovate. This has created the rather alarming situation in which a number of companies that have recently won large government contracts for COVID-19 related R&D are those that have never brought a single product to market, but rather, have shown their promise by simply amassing valuable IP.⁶³

The current approach to IP in the United States also reinforces racial, class, and gender inequality. For instance, it is well documented that there continues to be a stark “patent gap” in the country, meaning that women, low income individuals, and people of color are disproportionately less likely to hold or be granted a patent.⁶⁴ “Recent academic research has identified at least three major gaps in patenting,” Holly Fechner and Matthew Shapanka write. “Women, especially African American and Hispanic women, obtain patents at significantly lower rates than men; people of color obtain patents at significantly lower rates than whites; and individuals from lower-income families are significantly less likely to obtain a patent than individuals who grew up in wealthier families.”⁶⁵ Moreover, since most patents are issued to for-profit companies (85% vs. 9% to individuals in 2016), racial, gender, and economic disparities in company ownership are also critically important when considering the role that IP plays in driving inequality (for instance, 61% of White households own company stock, either directly or indirectly, compared with 31% and 28% of Black and Latinx households, respectively).^{66/67}

Big Pharma and Covid-19

— A Closer Look at IP and Public Health

The COVID-19 pandemic has revealed shocking deficiencies in our countries’ commitments to the health and safety of all. For instance, as Mike Davies notes, “public employees and other groups of unionized workers with decent coverage will have to make difficult choices between income and protection. Meanwhile, millions of low-wage service workers, farm employees, the unemployed, and the homeless are being thrown to the wolves.”⁶⁸

In general, the choice to prioritize corporate profits and IP rights over the development and distribution of effective, affordable medicines is both deadly and short-sighted. With little if any oversight, extraordinary amounts of public money are being pumped into a private monopoly-based system best placed to produce duplicative “me-too” drugs that generate excessive profits but have little to no impact on public health. To develop safe and effective medicines, especially vaccines during a global pandemic, cooperation and transparency are needed. But our IP regime prevents both.

As Ady Barkan and Zain Rizvi recently wrote in *The Nation*, “patent monopolies have fueled the current drug pricing crisis, and they may block access to any future Covid-19 vaccine.” Regarding Moderna, a company which recently made headlines with its vaccine candidate, the

authors warn that “the company has been granted over a hundred patent monopolies globally. If its vaccine proves safe and effective, Moderna’s monopolies will allow the corporation to set an exorbitant price...[and] block other manufacturers from supplying the vaccine.”⁶⁹ In the end, it is likely that governments will be forced to spend considerable sums to purchase a successful vaccine from companies like Moderna and distribute it to the public; another classic case of “double taxation” when considering the public funding that went into the vaccine development in the first place.

Critically, amid the current crisis of the COVID-19 pandemic, it is imperative that a global pool for all related technologies is created, which would allow for the compulsory sharing of intellectual property relating to medicines and vaccines during a health emergency. Access to medicines experts maintain that the real danger is in not pursuing a global IP pool and allowing corporate interests to artificially limit the supply of lifesaving technologies, essentially creating a “global vaccine apartheid.”⁷⁰ With a limited supply of vaccines or treatments, rich countries could monopolize the global supply leaving much of the planet to continue battling the pandemic – potentially for many years – without the proper tools. These fears are not unfounded given that the US, UK and EU have all already signed contracts to secure a high number of available doses of vaccine candidates currently in development.

However, despite having such contracts in place, an “every country for itself” strategy is very risky, even for rich countries. As the WHO put it in the announcement of the creation of its Access to COVID-19 Tools Accelerator (ACT-A), “we know that as long as anyone is at risk from this virus, the entire world is at risk – every single person on the planet needs to be protected from this disease.”⁷¹ Moreover, no one knows where a breakthrough will come from – for instance, currently, five of the top ten vaccine candidates are being developed in China – and unless a vaccine is accessible and affordable to everyone around the world, the health and economic impacts of the virus will continue to be profound.⁷² Only global cooperation with shared access to IP and R&D data can assure equitable, global access to vaccines and treatments, which in turn, is the most efficient way to end a global pandemic.

Goals and Principles of Democratic Public Ownership

While formal IP protections and rights are relatively new (and controversial) in world history, knowledge governance more generally, and research and development in particular, are foundational components of every economy, past, present, and future. As such, how they are conceptualized, designed, and implemented has significant economic, social, political, and ecological implications. Many observers and experts from across the political spectrum agree that the approach to IP & R&D that is currently predominant in many advanced countries, including the United States and United Kingdom, is no longer fit for purpose, let alone able to

support the development of a 21st century digital economy that is equitable, democratic, and environmentally sustainable.

While proposals for reforming the IP and R&D system vary widely, in the context of extending and enhancing democratic public control and ownership in the 21st century, we suggest the following key principles:

1. Reversing encroachment and expanding the public commons

Over the past several decades, the IP regime has grown in both scope and scale (albeit with variations and fluctuations depending on the type of IP protection), with knowledge generally becoming increasingly privatized and enclosed. Yet, research shows that these trends have had little to no effect on increasing innovation and efficiency. If anything, they have had the opposite effect, stifling competition, increasing inefficiency, and exacerbating inequality.

We believe that it is imperative to halt and begin to reverse this process of privatization and encroachment, and build (and rebuild) a public knowledge commons with fairer access as one of its core principles. Already there is a growing movement around the world in favor of a commons approach to IP and R&D, along with experimentation around commons licensing, patent pools, open source journals and code, peer to peer networks, and more. As Dean Baker, Arjun Jayadev, and Joseph Stiglitz write “while still relatively new, these movements promise the possibility of a more rational framework to maximise the use and generation of innovation, at least in some key areas.”⁷³

On the one hand, this movement should be consciously nurtured and supported, for instance by connecting publicly funded research and development to these commons approaches; on the other, the current, privatized and monopoly system of IP needs to be confronted, reduced, and, ultimately, transformed, for instance by limiting what can be patented and for how long. How this expanded public commons should be governed is also an important consideration. Although moving in the direction of making IP fully open would ensure that anyone could freely use it (while also encouraging more innovation that could build on the freely available IP from the public commons), this strategy runs the risk of replicating some the problems of the current model, as fully open IP may be exploited by powerful voices (and companies) dominating particular sectors.⁷⁴ In general, we believe that the democratic public ownership principles of decentralization, subsidiarity, participation, and multi-stakeholder representation could, and should, be integrated into management of a public IP commons in various ways.⁷⁵

2. Increasing public R&D and ensuring public benefit

Public funding and other support for R&D is an important cornerstone of most contemporary economic systems and has played some role in most, if not all, of the major technological advances of the modern era. While still large in absolute terms, public funding for R&D has begun to decline in recent decades and this has had a negative impact on innovation.

We believe that increased public funding and support for R&D is critical given the many intersecting economic, social, and ecological crises we now face and will continue to face as the 21st century progresses. The goal of this increase, combined with the other principles and recommendations we outline in the paper, is to rebalance private and public interests while at the same time significantly boosting R&D capacity and investment as a whole (in other words, while the public share of total R&D investment would rise significantly, the private share would either stay the same or fall modestly, leading to an overall increase).

Unsurprisingly, we also believe that public R&D funding should be focused (and refocused) on a broad conception of the common good, and on confronting the global threats to humankind. In other words, rather than directing public R&D funding towards instruments of war and destruction, or parochial and selfish national interests, these should be focused on pressing global issues such as climate change, disease prevention, and alleviating poverty.⁷⁶

Importantly, we believe that when public funding and support plays a role in the development of new technologies, products, and concepts, then the public should appropriately benefit (especially through ownership rights).

3. Global Solidarity and Reparations

The economies of the US, the UK, and other so-called technologically “advanced” nations were built on systems of imperialism and colonialism. Specifically, the wealth and resources from colonialism, enslavement, and imperial expansionism played a prominent role in enabling some of the great technological jumps in the history of advanced nations, notably the industrial revolution; and, vice versa, technological jumps like the industrial revolution helped entrench, deepen, and expand colonialism and imperialism.

Moreover, the US and the UK in particular continue to rely upon highly inequitable and extractive trade and other economic relationships with the rest of the world – particularly the Global South. In order to both address the harms caused by these historical injustices and confront the global problems we now face, we believe that processes of international reparations (such as economic and financial aid and debt forgiveness), technology transfer, and solidarity must be central to any agenda for IP and R&D reform specifically, and democratic public ownership in the 21st century generally.

Importantly, an international approach does not preclude in any way the necessity of domestic reparations. In the United States, for example, many technological advances (especially in the medical field) were developed through the extraction of value from, and exploitation of, people of color and marginalized communities – for instance, Henrietta Lacks’ cells, the Tuskegee experiment, and the testing of early HIV drugs on the LGBTQ community.⁷⁷ Moreover, health data on chronic diseases and ailments that disproportionately affect people of color and marginalized communities is worth billions of dollars to large corporations and is often protected by trade secrets, while at the same time those same communities continue to suffer from a lack of access to healthcare and prescription drugs (to say nothing of the social determinants of health – such as poverty, housing, and inequality – driving many of those chronic conditions).

4. Challenging corporations and monopoly power

The current IP and R&D system in both the US and UK serves primarily to entrench and protect corporate power and facilitates the consolidation and monopolization (or oligopolization) of various economic sectors. It also enables and supports corporate capture of political systems and institutions, along with the revolving door of appointments between industry and government. In particular, the increased scope and scale of IP protections, the use and abuse of defensive patents, and the exploitation of publicly funded research and development to bolster corporate profits has the effect of both decreasing (and disincentivizing) competition, increasing rent-seeking behavior, and weakening public control, transparency, and democratic

accountability.

We believe that changes to the IP and R&D system should prioritize reducing corporate and monopoly power. This means linking public ownership and control of IP and R&D to efforts to increase competition in various economic sectors (including various antitrust strategies and proposals) and the development of alternative models of ownership, including cooperatives, local, regional, and national publicly owned enterprises, and local and regionally based small and medium sized businesses that are ecologically sustainable and center racial and gender equity.

5. Worker Rights and Empowerment

The modern economy is increasingly becoming dominated by large tech companies (alongside traditional companies that have moved heavily into tech), the value of which are, to a large extent, determined by intangible assets, such as IP. Moreover, these corporations are increasingly wielding their control over IP to the detriment of workers, working conditions, and employment regulations.

The classic example is Uber, Lyft, and other so-called “sharing economy” companies. Infamously, these large, venture capital-backed corporations have tried to claim that their workforce are “independent contractors” exempt from various labor protections and regulations. This allows the companies to avoid significant employment costs. However, unlike true independent contractors, workers at these companies are still subjected to significant degrees of management control and oversight. Moreover, as Julia Tomassetti explains, these companies have often tried to justify this control in terms of defending their intellectual property.⁷⁸

We believe that the IP and R&D system should enhance, not weaken worker’s rights and empowerment. This may include worker representation and voice (both through trade unions and directly) in any and all new structures and approaches to intellectual property (such as commons approaches and patent pools), removing IP rights and protections from companies that use them to avoid labor protections and abuse workers, and linking public R&D funding to “just transition” strategies that shift workers to high-quality jobs in new, ecologically sustainable and socially beneficial industries.

Reforming the Production and Management of Knowledge

— Policy proposals for the US and UK

A fundamental problem with the current systems of IP and R&D are that they are exclusionary and designed to benefit private over public interests. In short, it is beneficial for companies seeking to extract economic rent and make good returns, but it does not necessarily deliver effective innovation that is in the public interest, ensure the equitable distribution of critical products and services, or appropriately value significant public and worker contributions to R&D processes.

In place of enclosure and corporate concentration, new public-centered management of IP and R&D can reshape how knowledge is produced and organised, allow the public to retain a stake, and boost socially useful innovation to benefit all. The following measures suggest some of the ways in which our current approach to IP and R&D can be transformed to meet the needs of society, the economy, and the environment.

1 Grow public investment

in socially and environmentally beneficial research and development to meet the needs of the future

15

— Increasing R&D investment

Throughout history, advances in innovation and industrial transformation have been supported in no small part through state-backed R&D investment. Such efforts often take time, and there are various routes to see investments pay off, but in general they are key to boosting broader productivity. However, public investment in R&D is both insufficient to address the challenges we now face, and in need of recentring around principles of equity, democracy, and sustainability (among others).

While still large in absolute terms, public funding for R&D has begun to decline in recent decades (relative to GDP) and this has had a negative impact on innovation. For instance, with regards to the US, Caleb Foote and Robert Atkinson found that “in 21 of the 27 years following 1990, federal R&D spending has made up a smaller share of GDP than the year before. It slid to just 0.62 percent of GDP in 2017, the lowest level since 1955, two years before the Soviets launched Sputnik. In other words, the U.S. government now invests less in R&D compared to the size of the economy than it has in more than 60 years. This has resulted in stagnant productivity growth, lagging competitiveness, and reduced innovation.”⁷⁹

In the UK, public funding for R&D (government, research councils and the devolved higher education funding councils) was £9.6 billion in 2018, 26% of the total.⁸⁰ In November 2017, the Government committed to increase the UK’s combined public and private R&D spend to 2.4% of GDP by 2027, which could increase total R&D investment by as much as £80 billion over the next 10 years.⁸¹ However, as previously mentioned, the public share of this amount

may remain significantly lower than it has been in recent decades.

As a first step, the UK and US must rise to the challenge of boosting R&D investment to promote the value of interdisciplinary innovation. We suggest that public funding (from all levels of government) for R&D should rise to at least 2% of GDP annually over the next ten years. In the US, this would reverse decades of decline and return public R&D investment to about what it was in the early 1960s. Along with a markedly different cultural and political attitudes towards the societal and economic role of government, national and international crises and imperatives (such as the Cold War and the Space Race) drove these high rates of public R&D investment. Arguably, the crises we now face are far greater and more existential than those of 60 years ago, and we should have at least the same level of R&D response.

For instance on climate change alone, the Intergovernmental Panel on Climate Change (IPCC) reported in 2018 that we had just 12 years to cut global warming pollution in half. Now, two years in, we have barely made any progress at all towards that goal and we are on track to experience some of the most catastrophic effects of runaway climate change.⁸² Moreover, in addition to deploying existing renewable energy and carbon reduction technologies, it is well understood that public R&D is critical to stopping climate change and mitigating its effects. “Many policies stimulate clean energy innovation and create global technology spillovers (e.g. carbon taxes, subsidies for renewable energy, phasing out fossil fuel subsidies),” a recent report from the organization “Let’s Fund” found.⁸³ “But the most effective policy is increasing government budgets for public clean energy research and development (R&D).” Furthermore, as David Roberts reports, while 24 countries and the European Commission pledged in 2015 to double their investments in clean energy R&D, few are on track to meet that goal. “Despite almost everyone agreeing on it, almost no one really does it, at least not at the scale it warrants,” Roberts writes. “It is perpetually underfunded, long past the time when it was clear that clean energy is vital to a safe human future.”⁸⁴

In both the US and the UK, setting a public investment baseline of at least 2% of GDP by 2030 would contribute, both directly and indirectly, to boosting total R&D investment (public and private) to considerably higher levels than currently exists or is planned. But where this investment is channelled and who it impacts matters. Today’s intertwined challenges, from environmental breakdown to the current public health emergency and the inequality crisis, necessitate a reorientation of where R&D investment is directed to better determine how IP is created, who it is created by, and what cause it aims to support.

— **Reforming tax system to improve investment**

The current tax enticements and subsidies offered to incentivise private sector R&D and, ultimately, IP creation carry an array of problems, from deadweight creating a substantial cost to the public purse, cross border tax competition, and market concentration of less innovative large companies, to encouraging companies to use their value in IP to sell off assets and pursue cost cutting measures to pay excessive dividends to shareholders, further undermining their ability to innovate.

Stepping back from a business as usual strategy of directing tax incentives and subsidies to established innovation sectors – effectively bolstering the capacity and deepening the power of those companies – we should reorient focus, and public resources, instead on broadening the base of innovation; deepening the diversity of organisations generating IP (to expand the business landscape and challenge market concentration of conglomerate companies); diversifying the geographical location of where the IP is generated through an interdisciplinary approach (levelling out the playing field and rebalancing patent creation outside of established

areas, such as the South East of the UK or Silicon Valley in the United States); and expanding the make-up of those generating IP through a robust industrial strategy centred on racial and economic equity and justice.

As shown, tax incentives, such as the R&D tax credit and patent box scheme in the UK, have resulted in ineffective outcomes by failing to invest sufficiently and purposefully, solidifying market concentration by disproportionately funding large companies that do not necessarily maximise innovation output when compared to younger, growing firms, and failing to maximise new innovations at a costly price to the state. Rather than tweaking at the margins of the current approach, governments in the UK and the US should reimagine how they finance and incentivize innovation and what purpose that innovation serves. There are several options for how this could be carried out.

For instance, in the UK the government should wind down the current, ineffective tax incentives for innovation. The combined cost of the R&D tax credits and the patent box scheme could then be redirected to fund public R&D investment. In the US, state and local governments in particular should use their economic development incentives (including tax breaks, subsidies, investments, and loans) to take ownership/equity stakes in promising companies and new technologies (the proceeds of which can be recycled into further direct investments in innovation and or be used to support social services, such as education, that indirectly support innovation).

— **Establishing Public Investment Banks**

Another recommendation, which could be combined with the first two, is to create a public investment bank or a series of national and regional investment banks, through which public investment in R&D could be channelled to grow innovation throughout the country and foster the development of small and medium sized enterprises (SMEs) and younger firms as part of a broader industrial strategy.

Drawing from the example of the recently established Scottish National Investment Bank, these national/regional investment bank(s) would be “mission orientated” in their approach.⁸⁵⁸⁶ More broadly, shifting to a mission-orientated approach could allow for a transition from the traditional investment focus of profit maximisation towards tackling challenges such as racial and economic inequality and prioritising investments that support alternative models of ownership, build community wealth, and level out national and regional imbalances.

2 Ensuring intellectual property serves the common good

We need a mission orientated approach to IP and R&D with clear outcomes and goals to address our intersecting and escalating crises. This includes mobilising a wide set of actors

– from universities to businesses to government – to focus the creation of IP on social, cultural, climate and economic goals that benefit society and the environment. The challenges we face today are profound and inherently intertwined. Tackling them will require accelerating innovation and orienting it towards social and environmentally beneficial goals that build an economy fit for the future.

First and foremost, conditions should be attached to receiving public support in order to “steer benefits directly to society.”⁸⁷ Moreover, in place of the current approach, we must install safeguards to allow the public to recoup costs and assets (such as IP) when a private company that has used publicly funded research violates certain common good standards.

— **Fair tax principles and good labour practises**

In principle, taxpayer R&D support should not be provided to companies and institutions that engage in tax avoidance schemes (such as off-shore tax havens and corporate inversions). In the UK, state support for R&D investment could further be contingent on companies that have gained the Fair Tax Mark, a not-for-profit certificate scheme that recognises organisations that pay the right amount of corporation tax at the right time and in the right place.⁸⁸ In prohibiting state-led R&D support for those using tax avoidance schemes, the government can incentivise the divestment from such arrangements, replenishing the tax base in the process. Similarly, IP protections could be withheld or revoked from companies that engage in such tax avoidance mechanisms.

The process of embedding principles of equity and justice into state support for R&D and IP protections should also be extended to workers’ rights and benefits. For instance, public R&D support might be provided exclusively to Living Wage employers, those with collective bargaining agreements, and or those with racially diverse workforces and management teams. Placing conditionality on state R&D investments and IP protections can help incentivise a shift away from the costly and extractive practises of corporate behaviour.

— **Social and environmental returns**

Intellectual property rights have a dramatic impact on our economic landscape and our climate. If harnessed for good, IP can help address the quality and availability of innovative ideas and products to address today’s interconnected challenges, from developing affordable access to medicine to driving technological advances to meet the climate crisis. While the beneficiaries are often large corporations, a key point is that the legal, administrative, and regulatory structure of IP is already provided by the government (as is much of the R&D support provided for the development of new IP).

In the UK and the US, one way in which we could reorient the focus of state support for IP generation to meet our needs would be to transform the strategy and mission of the Intellectual Property Office (in the UK) and the US Patent and Trademark Office, as well as R&D funding structures such as Innovate UK and the National Institutes of Health.

For instance, the IPO aims to deliver “excellent IP services” and create a world leading IP environment.⁸⁹ Creating a mission-driven approach for the creation and diffusion of intellectual property to incentivise IP that is social in purpose and sustainable by design could help transform the wider landscape.

One way in which this could be achieved is to require the IPO and USPTO to consider new or additional principles when making decisions to award patents, trademarks, and other IP protections.⁹⁰ In addition to the previously mentioned criteria around tax avoidance and workers’ rights, other principles might be adapted from the New

Economy Foundation's (NEF) Social Returns on Investment (SROI), which are as follows:⁹¹

1. Establishing scope and identifying key stakeholders. Clear boundaries about what the SROI will cover, and who will be involved are determined in this first step.
2. Mapping outcomes. Through engaging with stakeholders, an impact map, or theory of change, which shows the relationship between inputs, outputs and outcomes is developed.
3. Evidencing outcomes and giving them a value. This step first involves finding data to show whether outcomes have happened.
4. Establishing impact. Having collected evidence on outcomes and monetised them, those aspects of change that would not have happened anyway (deadweight) or are not as a result of other factors (attribution) are isolated.
5. Calculating the SROI by adding up all the benefits, subtracting any negatives and comparing them to the investment.
6. Reporting, using and embedding, involving embedding good outcomes processes within your organisation.

— **Intervening to serve the common good**

One of the primary problems with the current IP approach, as detailed in the sections on the pharmaceutical industry, is the lack of pricing regulations and usage requirements – a problem particularly prevalent in relation to essential goods and services where affordability and access are critical. In such cases, laws and regulations should be enacted to ensure that the government can seize or break IP protections on behalf of the public to provide those goods and services itself or license production or provision to a third party.

When it comes to publicly funded R&D, in the US the Bayh-Dole Act's "march-in" clause grants the government the right to force the patent holder to grant a "nonexclusive, partially exclusive, or exclusive license" to another party. While this clause exists, it has not yet been implemented. Similarly, Bayh-Dole's provisions around "paid up licences," 28 U.S. Code § 1498, and the use of the legal system to defend government patents are often overlooked tools the government could use to more forcefully intervene in the IP system and re-orient it towards public benefit.⁹² Moreover, at times in the past – most notably with the radio industry during World War I – the US government has broken patents to stimulate innovation and restructure economic sectors during times of crisis.⁹³ In the UK, interventions also exist to regulate pricing. As Just Treatment sets out, when the law on patents and monopolies was written "they realised that giving a company an unbreakable monopoly on a medicine could lead to terrible consequences - like patients dying without access to a potentially life-saving drug."⁹⁴ Strengthening, formalizing, and, above all else, actually using these types of interventions could go some way to alleviating the pricing and usage problem.

— **Regaining control of investment**

The economic, social, and ecological crises we now face are the result of decades of financialization, privatization, and neoliberalism. In order to confront and address these challenges we must urgently change course and guide investment and businesses activity towards the productive economy and ecological sustainability as part of a broader and more interventionist industrial strategy. Rather than assuming the benefits of R&D and IP protections will simply trickle down through growth and jobs, we need a realistic appraisal of the current

approach; one that recognises how companies operate in market systems without appropriate government regulation, planning, and control. Namely that they channel profits towards shareholders with business models geared towards short term, low risk profit generating strategies.

To tackle this, we need approaches that guide investment towards the productive economy. As Laplace and Mazzucato point out, “a real alternative is to enforce regulations establishing obligations for firms to reinvest in innovation.” Brazil is one international example of how this might work in practice. “Since the late 1990s,” Laplace and Mazzucato write, the country “has mandated that public and private companies in formerly privatised sectors reinvest a share of their profits into public R&D funds.”⁹⁵ Another example is Bell Labs in the United States, a famous R&D organization that is credited with spurring significant innovation in the 20th century. In 1956, AT&T – a private, vertically integrated corporation that held a monopoly over telephone communications in the country and was the parent of Bell Labs – entered into a consent decree with government antitrust regulators. In exchange for retaining its monopoly over the telephone network (the so-called “Bell System”), the company agreed to licence all of its existing patents, royalty free. Thus, Watzinger, et. al. write, “the path-breaking technologies developed by the Bell Laboratories became freely available to all US companies” through a process of government mandated compulsory licencing.⁹⁶

3 Growing the public stake in creations of the mind

We believe that when public funding and support plays a role in the development of new technologies, products, and concepts, then the public should appropriately benefit. This includes ensuring that the public secures or retains certain IP rights when public funding is used.

— Creation of IP Commons Entities

Drawing on recent research by Duncan McCann, one central way in which we can transform the ownership and management of publicly funded IP, enabling the public to retain a stake and departing from an approach grounded in enclosure, is the creation of an IP commons (or commonses) to govern and manage IP. Under such a system, all intellectual property that is the result of publicly funded research would have to be assigned to the government by its creator (with appropriate compensation agreed for any additional investment made by private or non-profit entities). This would require a change in the terms of the funding given out by the government, stipulating that any IP resulting from the grant would need to be assigned to the public. In the US, this would also require revising and reversing parts of the Bayh-Dole Act.

As McCann envisages, the government would create an IP Commons Management Body (IPCMB), which would administer the IP that was transferred to the government. This public entity, ideally governed by a multi-stakeholder board that includes worker, consumer, and environmental representatives, would then facilitate licencing agreements for third parties to use the IP and or decide to make certain IP open access. In cases where the IPCMB does not decide to make IP open access, the “licence will still be an ordinary, commercial licence and the terms and fees will be a private matter between the owner, in this case the IPCMB, and the licensee, but the IPO will step in if terms cannot be negotiated”, leaving the IPCMB focussed on sourcing a reasonable return, rather than profit maximisation, with licenses negotiated on a case by case basis.⁹⁷ The IPCMB could also be the recipient of any and all IP that is revoked or rescinded from private corporations due to misuse (or underuse) or exploitative practices (such as those described above with regards to tax avoidance and workers’ rights).

While this idea may seem novel for a government to carry out, the principles and theory behind it are integrated into standard practise in the private sphere, with firms granting IP licenses with flexible conditionalities and costs to various entities.

— Publicly funded venture capital funds

Key to the challenge of reimagining R&D is the need to reorient the role of the state from one reduced to correcting market defects (and intervening when the market system slips into crisis) to one involved in shaping and determining output and innovation.

Around the world and throughout history, there are numerous examples to draw on when thinking of ways to drive new practise in the UK and US. One of these is Yozma in Israel, which was described by a 2010 OECD report as “the most successful and original programme in Israel’s relatively long history of innovation policy.”⁹⁸ Established in 1993, Yozma has become a key government programme, investing around \$80 million for 40% stakes in ten new venture capital funds, offering them insurance covering 80% of the downside risk with the option to buy out the government’s share at a discount within five years.⁹⁹

Another example is Finnvera, a specialised financing company owned by the Finnish state and the Export Credit Agency of Finland, which provides “financing for the start, growth and internationalisation of enterprises and guarantees against risks arising from exports” to strengthen the operating potential and competitiveness of Finnish enterprises by offering loans, domestic guarantees, and export credit guarantees.¹⁰⁰ As of 2016, Finnvera had assets of €9.5 billion (£7.7 billion).¹⁰¹

And a third is the Maryland Venture Fund (MVF), an example of what can be done at the subnational level, especially in the United States. The MVF is a publicly owned “evergreen venture capital fund” with around \$135 million in assets.¹⁰² It makes equity investments in early stage companies (up to a 25% ownership stake) – particularly those in the technology and biotech sectors – with the dual mandate of generating financial returns to enable further state investment in innovation and “foster[ing] economic growth throughout the state.”¹⁰³

Governments at various levels could draw from these, and many other international examples, and create publicly funded and managed venture capital funds to invest and manage shares in private firms. Moreover, in the UK, public bodies and organisations already supporting R&D, such as UKRI and Scottish Enterprise, could claim an equity stake in the patents generated from their investments.

4 Challenging corporate power:

The example of pharmaceuticals

The World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) provides a legal framework to establish minimum requirements for the protection of intellectual property for its members. In the context of pharmaceuticals, the patent holder can obtain exclusive rights for a 20-year period at a minimum, allowing them to charge a premium rate for the drug. While many countries (including India and Argentina) have used important safeguards within TRIPS (known as flexibilities) to limit IP protections, preventing or overcoming monopolies on medicines in the name of public health, resistance to their use has been intense. The US and many European governments, along with pharmaceutical companies, have exerted extreme pressure on countries pursuing the use of these flexibilities including threatening to impose trade sanctions and cut off countries' medical supplies. For instance, Swiss-based pharmaceutical company Novartis threatened to sue Colombia in an international investment tribunal under the terms of a bi-lateral trade deal in 2016 for their attempt to access affordable medicine for leukaemia using TRIPS flexibilities.^{104/105}

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In the UK, mechanisms exist to control and regulate the price of drugs. This includes the National Institute for Health and Care Excellence (NICE), which assesses the cost effectiveness of medicines in England and advises whether the NHS should use them, and its sister organisation Scottish Medicines Consortium. Past this, the government oversees the Voluntary Scheme for Branded Medicines Pricing and Access – the successor to the Pharmaceutical Price Regulation Scheme – and sets a cap on the total NHS spend on branded medicines. While the system limits overall spending on patented medicines by the NHS, should NICE, or an equivalent body, reject drugs because of the excessive pricing demands of drug companies, patients can be left without access to the medicine.



Yet, UK national and international law recognises the right to health, and thus allows for provisions to use such patents without the authorisation of the patent holder. This includes sections 55-59 of the UK Patents Act 1977 (as amended), which is supported at an international level by Trade-Related Aspects of Intellectual Property Rights (TRIPS).¹⁰⁶ These mechanisms were used in the 1960s and 70s to supply generic medicines to the NHS, and were the subject of a landmark legal case confirming in the highest courts the NHS' right to import generic versions of one of pharmaceutical giant Pfizer's antibiotics for use in NHS hospitals.¹⁰⁷

A safeguard in place to prevent the NHS being priced out of drugs is known as a Crown use licence, whereby the government has the power to give another company permission to make and sell an exact, high-quality, drug after paying a fair royalty to a company. The first and most immediate step the government should take is to enact this safeguard to strip pharmaceutical companies of their exclusive patents and secure access to vital drugs (based on a framework developed through a multi-stakeholder process with input from experts, patients, and public officials).¹⁰⁸ Whilst rarely used in recent years, in June 2019, following pressure from patients and their families, as well as the campaign group Just Treatment, the UK Government did acknowledge its "moral obligation" to explore the use of this and other flexibilities to secure an affordable generic supply of the cystic fibrosis drug, Orkambi. This move followed a stand-off with the manufacturer, Vertex, which was utilising its monopoly to hold patients' lives to ransom in an effort to extract an unjustifiably high price for its medicine from the health service (despite the public sector having supported the drug's development).¹⁰⁹

Relatedly, going forward the UK and US governments should ensure (through passing new legislation or amending existing legislation) that new drugs and treatments created with significant public funding cannot be monopolized and enclosed by large corporations. For instance, In May 2020, £84 million of new government funding was provided to Oxford University and pharmaceutical company AstraZeneca for their work to develop a COVID-19 vaccine.¹¹⁰ Patient groups and campaigners joined together to call on AstraZeneca to fully disclose its plans and ensure that any vaccine created be patent-free. As Just Treatment's Diarmaid McDonald explains, "they [AstraZeneca] haven't created this vaccine, they aren't taking a risk in producing it, why should they get the chance to make monopoly profits from it either now or in the future? NHS staff and patients, and people around the world, expect action to prevent any monopoly undermining access to this potentially world changing vaccine."¹¹¹

But, beyond this, broader problems are likely to persist in an industry geared towards maximising profits, requiring a shift in priorities to focus on broader societal and economic goals, safeguards, and rights. To that end, we recommend the creation of a system of publicly owned pharmaceutical development, manufacturing, and distribution entities to not only ensure accessible pricing of drugs in the UK and US, but safeguard affordable medicine elsewhere through technology transfers. Full details of this approach can be found in the report "Medicine For All: The Case for a Public Option in the Pharmaceutical Industry" by our colleague and co-author Dana Brown.¹¹²

5 Towards a global approach & technology transfers:

The COVID-19 example

A central component of the process of IP reform must be global solidarity and reparations through various forms of technology transfer and sharing. This goes beyond simply making it more affordable for lower income countries to purchase products and services owned and controlled by large corporations headquartered in the Global North. Rather it should involve transferring certain IP rights, removing IP restrictions on certain critical innovations completely, and overhauling the pro-corporate, pro-enclosure IP rules and systems that predominate in international free trade agreements and institutions.

Tentative steps have been taken at an international level to begin to move in this direction. WIPO, for example, through its Development Agenda, has acknowledged how “the international transfer of technology and technical know-how promotes economic development in poorer regions, while also helping to open new markets with increased social and political stability that can have global benefit,” in line with the United Nations Sustainable Development Goals.¹¹³ But, as the South Centre highlights, the agenda has not gone far enough.¹¹⁴ There are a multitude of steps that need to be taken to transform IP on an international scale, but for the purpose of this report, we have chosen to highlight the example of a COVID-19 vaccine. The following steps are by no means exhaustive, but are meant to be illustrative of the interventions and approaches needed in a wide variety of sectors.

We need to develop a flexible approach to IP and R&D to enable a meaningful wave of tech transfer. This includes exploring a workable approach to licensing, royalty rates, and the benefits of open access models, particularly in essential goods and services like medicines. More immediately, however, we need to move urgently to address COVID-19 and forestall the possibility that it drives further geographic and social inequality.

Despite the World Health Assembly of the World Health Organization (WHO) reaffirming the role of WHO as the directing and coordinating authority on international health work and recognizing that all countries should have timely and affordable access to diagnostics, therapeutics, medicines, vaccines, and other essential health technologies and equipment to respond to COVID-19, it did not define concrete actions to address this in areas such as vaccine development. The development of a universal, free vaccine for all is key to addressing this devastating crisis. Building on the TRIPS framework, measures need to be taken as a matter of urgency to promote transparency around the costs and results of R&D as well as bolstering the “sharing of data, tools and technologies, and participate in capacity building through technology transfer.”¹¹⁵

Going further, campaign organisations such as Oxfam have called for an end to socialising the risk of this research (through government funding), only to privatise the reward by enabling private firms to reap the benefits. Instead they recommend ensuring that this

reward is also shared by the public with a “new more public system [that] would help break free of the suffocating web of intellectual property and patents that has cost so many lives.”¹¹⁶

Moreover, by the pharmaceutical industry’s own estimates, no single company has anywhere near the production capacity needed to meet global demand for COVID-19 vaccines or treatments. Thus, if IP rights block manufacturers from ramping up production, it could be an issue of life and death for millions around the world, as it has been for decades with AIDS and other infectious diseases like tuberculosis. Already, the Trump administration has offered large sums of money to get exclusive access to a coronavirus vaccine being developed by a German company; and the US, UK, and EU are entering into contracts with multiple vaccine manufacturers that virtually assure these high-income countries will monopolize much of the world’s COVID-19 vaccine supply in the first years after one becomes available on the market.¹¹⁷

Similarly, in June 2020 it was announced that the United States had bought up all of Gilead’s supplies of its IP-protected drug remdesivir (despite widespread concerns about its efficacy in treating COVID-19) sparking fears of shortages in countries around the world.¹¹⁸ Examples such as these portends a bleak future in which IP and R&D is increasingly used to fuel nationalist and imperialist imperatives as the world confronts the escalating health, ecological, and social challenges associated with run-away climate change.

As of writing, there has already been at least one lawsuit over pharmaceutical IP rights that is holding up production of a promising COVID-19 vaccine candidate, INO-4800, developed by Inovio Pharmaceuticals.¹¹⁹ The vaccine candidate, which is backed by the Coalition for Epidemic Preparedness Initiative (CEPI) and the Gates Foundation, is one of a number of COVID-19 vaccine candidates that rely on new technologies protected by IP controlled by other companies. In this case, the biologics manufacturer VGXI, which Inovio had hired to produce early batches of its vaccine candidate, refused Inovio’s request to transfer key trade secrets to other manufacturers in order to scale up manufacturing. A recent US Patent and Trademark Office ruling is also expected to hold up progress on Moderna’s COVID-19 vaccine candidate as it would enable a rival company to block the sale of Moderna’s vaccine until the IP dispute is settled.¹²⁰ These are likely the first of many such cases that will arise as in the global race for an effective COVID-19 vaccine.

Fears of just this sort of scenario led the WHO to champion Costa Rica’s proposal for a global IP pool on all COVID-19 related technologies in May 2020.¹²¹ Though supported by dozens of member states, pharmaceutical giants such as AstraZeneca, GlaxoSmithKline, Pfizer and Johnson & Johnson have vehemently opposed the idea, with Pfizer chief executive Dr. Albert Bourla saying “I think it is nonsense,” and calling the move, “dangerous.”¹²² Moreover, while most countries around the world, including China, backed a resolution calling for the equitable distribution of any successful vaccines globally, the US failed to support the move which would allow for the compulsory sharing of intellectual property relating to medicines and vaccines during a health emergency.¹²³

Such an approach could further be integrated into trade agreements, including through negotiation or re-negotiation of regional or bilateral free trade agreements between high income and low or middle income countries.¹²⁴ There are serious limitations to this approach, however, hampered by the imbalance of power between countries involved in the negotiation of trade agreements, the prevalence of corporate power and influence in trade negotiations, and the general predominance of neoliberal ideology and frameworks amongst trade negotiators and government policy makers. This further reinforces the need to embed principles of global solidarity and reparations into any and all policy proposals to reform the IP and R&D systems in both the US and UK.

Conclusion

As countries grapple with the devastating challenges of COVID-19 and we, hopefully, move closer towards the development of a vaccine, the injustices and insufficiencies of the current approach to IP and R&D are becoming increasingly apparent. It is an imperative that we quickly move away from the current system that prioritises corporate profits sourced from monopoly rights to one that values and centers public health, social equality, and ecological sustainability.

The design, implementation, and governance of our IP and R&D systems is critically important. However, the incredible rise of the intangible economy has dramatically altered these systems and our wider economic landscape. Rather than stimulating and supporting the innovation needed to power the 21st century digital economy, the enclosure of ownership of creations of the mind has been capitalised on to generate vast profits and considerably increase the power and control of a small group of large corporations and their owners. This has resulted in a series of adverse consequences, from languishing innovation to exacerbating racial, economic, gender, and geographic inequality, to reducing competition, to abusive corporate practices related to workers' rights, tax justice, and consumer protections. In sum, it is becoming increasingly clear to observers from across the political spectrum that the current approach to IP and R&D is not fit for purpose.

Given their inherently political nature and central role in the economic system, were our IP and R&D systems to be transformed, they could be harnessed for the common good and to build an equitable, democratic and environmentally sustainable future for all. Extending principles of democratic ownership is key to this transformation. From the creation of a public knowledge commons, to substantially increasing public R&D funding, to embedding global solidarity and reparations, to challenging corporate power, to bolstering workers' rights, we have the power to reimagine management of creations of the mind.

Through increasing public R&D investment to 2% or more of national GDP, we can significantly boost innovation to address the many intersecting crises and challenges we now face (and are likely to face as the century progresses), and channel that investment to stimulate innovations that benefit society, promote equality, and create environmental reliance and an ecologically sustainable economy. This investment would be supported by a new ecosystem of institutions, such as local, regional, and national publicly owned investment banks, as well as approaches to provide a foundation through which alternative models of ownership can flourish to challenge corporate power.

In place of inefficient tax giveaways, incentives, and subsidies, we should develop a mission orientated approach to ensure that innovations are geared toward tackling today's intersecting crises, safeguarded by strong regulations and the mandate for proactive public intervention and economic planning. At the heart of this strategy is the need to significantly grow the public stake in IP, by reorienting the role of the state from a laissez faire and crony capitalist approach to one inherently involved in shaping the production and distribution of innovations. This should be done first and foremost through the development of a publicly owned and democratically governed IP commons to redirect revenue generated from patents back into the public purse (and back into further investments in innovation), rein in and reshape corporate behaviour by safeguarding workers' rights and preventing tax abuse and loopholes, stimulate

innovation, and promote equality. This would be complemented by the creation of publicly owned, and democratically governed venture capital funds at various levels of governance to provide investment (in return for appropriate ownership stakes) in start-up ventures and highly innovative enterprises.

As the COVID-19 crisis has demonstrated, we particularly need to explore pioneering ways to reverse the stagnation in the development of needed medical products, control drug prices, and bring about universal access to medicines, clawing back the power and control exerted over this vital sector from big pharmaceutical companies. In place of corporate capture and control over lifesaving and life-prolonging medicines, we need publicly directed, accountable, and owned pharmaceutical development, manufacturing, and distribution entities to not only regulate pricing in the US and UK but provide access to medicines throughout the world through technological transfers.

Indeed, from COVID-19 to the climate crisis to rampant social and economic inequality, the interwoven crises we face today are international in their nature. Moreover, the US and UK in particular must acknowledge and actively redress the incredible harm they have wrought on much of the rest of the world, especially the Global South, through colonialism, enslavement, imperialism, and the ongoing process of wealth and knowledge extraction. A reparative approach in general, and technological transfers in particular, must thus go far beyond simply making prices more affordable and products more available in the Global South. Instead, any new approach to IP and R&D must center a comprehensive shifting of rights and control by transferring certain IP, removing IP restrictions on various critical innovations and making them available to all, and overhauling the pro-corporate, pro-enclosure IP rules and systems that predominate in international free trade agreements and international institutions.

IP and R&D systems and approaches are critical to the functioning of any economic system, and despite decades of privatization, enclosure, and corporate capture, they are still, largely, within our ability to reimagine and redesign. By applying principles of democratic public ownership and control, we can, and must, turn these systems into engines that power an equitable, democratic, and sustainable 21st century economy.

Endnotes

- 1 Data in particular is the source of incredible value in our contemporary economy. Ownership and control of data will be the primary focus of a forthcoming paper in this “Ownership Futures” series.
- 2 Gardner, J. (2020). In rare move, Gilead gives up 'orphan' status for experimental coronavirus drug. [online] BioPharmaDrive. Available at: <https://www.biopharmadive.com/news/coronavirus-gilead-remdesivir-orphan-drug/574882/> (Accessed 22 June 2020).
- 3 Nagarajan, S. (2020). Pharmaceutical Giants Have Added \$51 Billion to Their Market Value in 2020 as They Scramble to Develop a Coronavirus Vaccine. [online] Markets Insider. Available at: <https://markets.businessinsider.com/news/stocks/coronavirus-vaccine-boosts-big-pharma-market-capitalizations-50-billion-dollars-2020-6-1029350789> (Accessed 29 June 2020).
- 4 WHO & WB (2017). Tracking Universal Health Coverage: 2017 Global Monitoring Report. [online] World Health Organization and World Bank. Available at: <https://apps.who.int/iris/bitstream/handle/10665/259817/9789241513555-eng.pdf;jsessionid=9B9CEEDC8ACC2EF84D66C52B2A264CD2?sequence=1> (accessed 29 June 2020).
- 5 AU (2020). COVID-19 Vaccine Development and Access Virtual Conference. [online] African Union and Africa CDC. Available at: <https://africacdc.org/news-item/covid-19-vaccine-development-and-access-virtual-conference/> (Accessed 1 July 2020).
- 6 WIPO (no date). What is Intellectual Property? [online] World Intellectual Property Organization. Available at: <https://www.wipo.int/about-ip/en/> (Accessed 29 June 2020).
- 7 EFF (no date). Intellectual Property: The Term [online] Electronic Frontier Foundation. Available at: <https://www.eff.org/issues/intellectual-property/the-term> (Accessed 14 August 2020).
- 8 Johnson, S. (2015). Guide to Intellectual Property: What is it, how to protect it, how to exploit it. New York: Public Affairs.
- 9 Qureshi, Z. (2018). Intellectual Property, Not Intellectual Monopoly. [online] Brookings. Available at: <https://www.brookings.edu/opinions/intellectual-property-not-intellectual-monopoly/> (Accessed 22 June 2020).
- 10 Wiens, K. and Chamberlain, E. (2018). John Deere Just Swindled Farmers out of Their Right to Repair. [online] Wired. Available at: <https://www.wired.com/story/john-deere-farmers-right-to-repair/> (Accessed 22 June 2020).
- 11 Krishtel, P. (2019). Why Are Drug Prices so High? Investigating the Outdated US Patent System. [online] TED. Available at: https://www.ted.com/talks/priti_krishtel_why_are_drug_prices_so_high_investigating_the_outdated_us_patent_system (Accessed 22 June 2020).
- 12 Harding, S.D. (2016). “Meet the Patents: Fostering Innovation and Reducing Costs by Opening Patent Portfolios.” *Journal of Business & Technology Law*, 11(2).
- 13 Lee, T.B. (2014). Getting patents is preposterously easy under Obama. [online] Vox. Available at: <https://www.vox.com/2014/5/5/5682926/getting-patents-is-preposterously-easy-under-obama> (Accessed 14 August 2020); Sagonowsky, E. (2020). “AbbVie, already famous for its Humira strategy, forms another 'patent wall' around Imbruvica: report. [online] Fierce Pharma. Available at: <https://www.fiercepharma.com/pharma/abbvie-already-famous-for-its-humira-strategy-forms-another-patent-wall-for-imbruvica-report#:~:text=I%2DMAK%20in%202018%20found,patents%20successfully%20held%20them%20off> (Accessed 20 August 2020).
- 14 Kapczynski, A. (2012). “The Cost of Price: Why and How to Get Beyond Intellectual Property Internalism”. *UCLA Law Review*, 970. <https://www.uclalawreview.org/pdf/59-4-3.pdf>
- 15 Kapczynski, A. (2012). “The Cost of Price: Why and How to Get Beyond Intellectual Property Internalism”. *UCLA Law Review*, 970.
- 16 Stiglitz, et. al. (2017) Intellectual Property for the Twenty-First Century Economy. [online] Project Syndicate. Available at: <https://www.project-syndicate.org/commentary/intellectual-property-21st-century-economy-by-joseph-e--stiglitz-et-al-2017-10?barrier=accesspaylog> (Accessed 22 June 2020).
- 17 Baker, et. al. (2017) Innovation, Intellectual Property, and Development: A Better Set of Approaches for the 21st Century. [online] AccessIBSA. Available at: <https://cepr.net/images/stories/reports/baker-jayadev-stiglitz-innovation-ip-development-2017-07.pdf> (accessed 22 June 2020).
- 18 Porter, E. (2015). Government R&D, Private Property and the American Taxpayer. [online] New York Times. Available at: <https://www.nytimes.com/2015/05/27/business/giving-taxpayers-a-cut-when-government-rd-pays-off-for-industry.html> (Accessed 15 July 2020).

- 19 Reuters (2019). Google shifted \$23 billion to tax haven Bermuda in 2017. [online] Reuters. Available at: <https://www.reuters.com/article/us-google-taxes-netherlands/google-shifted-23-billion-to-tax-haven-bermuda-in-2017-filing-idUSKCN1OX1G9> (accessed 15 July 2020).
- 20 Zuboff, S. (2019). *How Google Discovered the Value of Surveillance*. [online] Longreads. Available at: <https://longreads.com/2019/09/05/how-google-discovered-the-value-of-surveillance/> (accessed 10 July 2020).
- 21 Zuboff, S. (2019). Facebook, Google and a dark age of surveillance capitalism. [online] Financial Times. Available at: <https://www.ft.com/content/7fafec06-1ea2-11e9-b126-46fc3ad87c65> (Accessed 10 July 2020).
- 22 Mazzucato, M. (2015). *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. New York: PublicAffairs.
- 23 Public Citizen (2020). *Government Funds Coronavirus Research While Pharma Sits By*. [online] Public Citizen. Available at: <https://www.citizen.org/news/government-funds-coronavirus-research-while-pharma-sits-by/> (Accessed 22 June 2020); Azar, A.M. (2020). *Secretary Azar White House Remarks on Operation Warp Speed*. [online] HHS.Gov. Available at: <https://www.hhs.gov/about/leadership/secretary/speeches/2020-speeches/secretary-azar-white-house-remarks-on-operation-warp-speed.html> (Accessed 22 June 2020).
- 24 Alperovitz, G. (2016). *Technological Inheritance and the Case for a Basic Income*. [online] Medium. Available at: <https://medium.com/economicsecproj/technological-inheritance-and-the-case-for-a-basic-income-ded373a69c8e> (Accessed 22 June 2020).
- 25 K.N.C. (2019). *The Value of Freeing Ideas, Not Just Locking them Up*. [online] Economist. Available at: <https://www.economist.com/open-future/2019/11/08/the-value-of-freeing-ideas-not-just-locking-them-up> (Accessed 22 July 2020).
- 26 Kapczynski, A. and Kesselheim, A.S. (2016). "Government Patent Use: A Legal Approach To Reducing Drug Spending". *Health Affairs*, 35(5).
- 27 Qureshi, Z. (2018). *Intellectual Property, Not Intellectual Monopoly*. [online] Brookings. Available at: <https://www.brookings.edu/opinions/intellectual-property-not-intellectual-monopoly/> (Accessed 22 June 2020).
- 28 Bauwens, M. (2020). *Connecting the Dots the P2P Way: The Commons as the Response to the Structural Crises of the Global System*. [online] Commons Transition. Available at: <https://commonstransition.org/connecting-the-dots-the-p2p-way/> (Accessed 22 June 2020).
- 29 Kapczynski, A. (2017). "Order without Intellectual Property Law: Open Science in Influenza". *Cornell Law Review*, 102(6).
- 30 Silverman, E. (2020). *The WHO Launched a Voluntary Patent Pool. What Happens Next?* [online] STAT. Available at: <https://www.statnews.com/pharmalot/2020/05/29/who-covid19-coronavirus-patents/> (Accessed 22 June 2020).
- 31 Intellectual Property Office (2020). *About Us*. [online] Gov.uk. Available at: <https://www.gov.uk/government/organisations/intellectual-property-office/about> (Accessed 22 July 2020).
- 32 Intellectual Property Office (2019) "How the IPO regulates licensing bodies" <https://www.gov.uk/government/publications/how-the-ipo-regulates-licensing-bodies/how-the-ipo-regulates-licensing-bodies>
- 33 Intellectual Property Office (2020). *Licensing Bodies and Collective Management Organisations*. [online] Gov.uk. Available at: <https://www.gov.uk/guidance/licensing-bodies-and-collective-management-organisations#overview> (Accessed 22 July 2020).
- 34 House of Commons Library (2018). *Brexit: new guidelines on the framework for future EU-UK relations*. [online] House of Commons Library. Available at: <https://commonslibrary.parliament.uk/research-briefings/cbp-8289/> (Accessed 22 July 2020).
- 35 Intellectual Property Office (2020). *Intellectual Property and the Transition Period*. Available at: <https://www.gov.uk/government/news/intellectual-property-and-the-transition-period>
- 36 Rhodes, D., Hutton, C., and Ward, M. (2020). *Research and Development Spending*. [online] House of Commons Library. Available at: <https://commonslibrary.parliament.uk/research-briefings/sn04223/> (Accessed 12 August 2020).
- 37 McCann, D (2020). *Commoning Intellectual Property, Common Wealth* <https://www.common-wealth.co.uk/reports/commoning-intellectual-property>

- 38 McCann, D (2020). Commoning Intellectual Property, Common Wealth <https://www.common-wealth.co.uk/reports/commoning-intellectual-property>
- 39 Innovate UK (2020). About Us. [online] Gov.uk. Available at: <https://www.gov.uk/government/organisations/innovate-uk/about> (Accessed 22 July 2020).
- 40 McCann, D (2020). Commoning Intellectual Property, Common Wealth <https://www.common-wealth.co.uk/reports/commoning-intellectual-property>
- 41 Jacobs, M. et. al. (2017). Industrial Strategy: Steering structural change in the UK economy. [online] IPPR. Available at: https://www.ippr.org/files/2017-11/1511445722_industrial-strategy-cej-november17.pdf (Accessed 22 July 2020).
- 42 Patent Box (2019). Statistics on uptake of the Patent Box. [online] HMRC. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/837487/Patent_Box_Statistics_2016-17_and_2017-18_partial.pdf (Accessed 22 July 2020).
- 43 HM Revenue & Customs (2020). Use the Patent Box to reduce your Corporation Tax on profits. [online] Gov.uk. Available at: <https://www.gov.uk/guidance/corporation-tax-the-patent-box> (Accessed 22 July 2020).
- 44 Patent Box (2019). Statistics on uptake of the Patent Box. [online] HMRC. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/837487/Patent_Box_Statistics_2016-17_and_2017-18_partial.pdf (Accessed 22 July 2020).
- 45 Patent Box (2019). Statistics on uptake of the Patent Box. [online] HMRC. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/837487/Patent_Box_Statistics_2016-17_and_2017-18_partial.pdf (Accessed 22 July 2020).
- 46 Patent Box (2019). Statistics on uptake of the Patent Box. [online] HMRC. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/837487/Patent_Box_Statistics_2016-17_and_2017-18_partial.pdf (Accessed 22 July 2020).
- 47 Miller, H (2013) EU Commission labels UK Patent Box harmful tax competition, IFS. Available at: <https://www.ifs.org.uk/publications/6899#:~:text=The%20EU%20Commission%20has%20opined,to%20be%20derived%20from%20patents>
- 48 Intellectual Property Office (2016). Gender Profiles in UK Patenting: An analysis of female inventorship. [online] Gov.uk. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/514320/Gender-profiles-in-UK-patenting-An-analysis-of-female-inventorship.pdf (Accessed 22 July 2020).
- 49 Jacobs, M. et. al. (2017). Industrial Strategy: Steering structural change in the UK economy. [online] IPPR. Available at: https://www.ippr.org/files/2017-11/1511445722_industrial-strategy-cej-november17.pdf (Accessed 22 July 2020).
- 50 Clift, C. (2019). The NHS Is Not for Sale – But a US–UK Trade Deal Could Still Have an Impact. [online] Chatham House. Available at: <https://www.chathamhouse.org/expert/comment/nhs-not-sale-us-uk-trade-deal-could-have-impact> (Accessed 22 July 2020).
- 51 Brown, D., et. al. (2019). Democratic public ownership in the UK pharmaceutical sector. [online] Global Justice Now. Available at: https://www.globaljustice.org.uk/sites/default/files/files/resources/democratic_public_ownership_in_uk_pharmaceutical_sector_sept_2019.pdf (Accessed 22 July 2020).
- 52 Mazzucato, M. et. al. (2018). The people's prescription: Re-imagining health innovation to deliver public value. [online] UCL Institute for Innovation and Public Purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/peoples_prescription_report_final_online.pdf (Accessed 22 July 2020).
- 53 Brown, D., et. al. (2019). Democratic public ownership in the UK pharmaceutical sector. [online] Global Justice Now. Available at: https://www.globaljustice.org.uk/sites/default/files/files/resources/democratic_public_ownership_in_uk_pharmaceutical_sector_sept_2019.pdf (Accessed 22 July 2020).
- 54 U.S. Copyright Office (no date). Timeline 18th Century. [online] Copyright.gov. Available at: https://www.copyright.gov/timeline/timeline_18th_century.html (Accessed 22 June 2020).
- 55 Trade secrets are generally within the purview of state law, however most states have adopted some version of the Uniform Trade Secrets Act (UTSA). See: LII (no date). Trade Secret. [online] Legal Information Institute. Available at: https://www.law.cornell.edu/wex/trade_secret (Accessed 16 August 2020); This constitutional clause pertains specifically to patents and copyright, with other IP protections emerging primarily from competition law. See: United States Constitution (no date). Article I. [online] Legal Information Institute. Available at: <https://www.law.cornell.edu/constitution/articlei> (Accessed 22 June 2020).

- 56 Heller, M.A. and Eisenberg, R.S. (1998) "Can Patents Deter Innovation? The Anticommons in Biomedical Research". *Science*, 280(5364).
- 57 Thomas, J.R. (2016) March-In Rights Under the Bayh-Dole Act. [online] Congressional Research Service. Available at: <https://fas.org/sqp/crs/misc/R44597.pdf> (Accessed 23 June 2020).
- 58 Penman, J. and Quigley, F. (2017). "Better Late than Never: How the U.S. Government Can and Should Use Bayh-Dole March-In Rights to Respond to the Medicines Access Crisis". *Willamette Law Review*, 53.
- 59 Chien, C.V. (2018). "Inequality, Innovation, and Patents". Santa Clara Univ. Legal Studies Research Paper, no. 2018-03.
- 60 Boldrin, M. and Levine, D.K. (2013). "The Case against Patents". *Journal of Economic Perspectives*, 27(1).
- 61 I-MAK (no date). Overpatented, Overpriced. [online] Available at: <https://www.i-mak.org/overpatented/> (Accessed 22 June 2020).
- 62 Qureshi, Z. (2018). Intellectual Property, Not Intellectual Monopoly. [online] Brookings. Available at: <https://www.brookings.edu/opinions/intellectual-property-not-intellectual-monopoly/> (Accessed 22 June 2020).
- 63 Sternlicht, A. (2020). Scientists Raise Questions About Moderna Vaccine In Market-Shaking Report. [online] Forbes. Available at: <https://www.forbes.com/sites/alexandrasternlicht/2020/05/19/scientists-raise-questions-about-moderna-vaccine-in-market-shaking-report/> (Accessed 22 June 2020); Rowland, C., et al. (2020). Hedge Fund Manager Stands to Profit on 'Flip' of Taxpayer-Funded Coronavirus Drug. [online] Washington Post. Available at: <https://www.washingtonpost.com/business/2020/06/11/coronavirus-drug-ridgeback-biotherapeutics/> (Accessed 22 June 2020).
- 64 Cox, K.L. (2018). The Minority Gender Patent Gap. [online] Above the Law. Available at: <https://abovethelaw.com/2018/08/the-minority-gender-patent-gap/> (Accessed 24 June 2020); Cook, L. and Gersom, J. (2019). The Implications of U.S. Gender and Racial Disparities in Income and Wealth at Each Stage of the Innovation Process. [online] Washington Center for Equitable Growth. Available at: <https://equitablegrowth.org/the-implications-of-u-s-gender-and-racial-disparities-in-income-and-wealth-inequality-at-each-stage-of-the-innovation-process/#footnote-26> (Accessed 24 June 2020).
- 65 Fechner, H. and Shapanka, M.S. (2018). Closing Diversity Gaps in Innovation: Gender, Race, and Income Disparities in Patenting and Commercialization of Inventions. *Technology and Innovation*, 19.
- 66 National Science Board, (2018). Science and Engineering Indicators, 2018: Chapter 8] Invention, Knowledge Transfer, and Innovation. [online] Available at: <https://www.nsf.gov/statistics/2018/nsb20181/report/sections/invention-knowledge-transfer-and-innovation/introduction> (Accessed 16 August 2018).
- 67 "Stock investing, with the power of compounding wealth that it spits out over the years, is dominated by the affluent, and in America that overwhelmingly means White people," May Reyes writes in Bloomberg. See: Reyes, M. (2020). The Stock Market Feeds the Racial Inequality It's Free to Ignore. [online] Bloomberg. Available at: <https://www.bloomberg.com/news/articles/2020-06-20/the-stock-market-feeds-the-racial-inequality-it-s-free-to-ignore> (Accessed 16 August 2020).
- 68 Davis, M. (2020). Mike Davis on Coronavirus: "In a Plague Year." [online] Jacobin. Available at: <https://jacobinmag.com/2020/03/mike-davis-coronavirus-outbreak-capitalism-left-international-solidarity> (Accessed 22 July 2020).
- 69 Barkan, A. and Rizvi, Z. (2020). The Covid-19 Vaccine Should Belong to the People. [online] The Nation. Available at: <https://www.thenation.com/article/society/the-covid-19-vaccine-should-belong-to-the-people> (Accessed 23 July 2020).
- 70 Maybarduk, P. (2020) To Ensure Vaccine Access, Gavi Must Hold Corporations Accountable. [online] Public Citizen. Available at: <https://www.citizen.org/news/to-ensure-vaccine-access-gavi-must-hold-corporations-accountable/> (Accessed 23 June 2020).
- 71 WHO (2020). Access to COVID-19 Tools (ACT) Accelerator. [online] World Health Organization. Available at: [https://www.who.int/publications/m/item/access-to-covid-19-tools-\(act\)-accelerator](https://www.who.int/publications/m/item/access-to-covid-19-tools-(act)-accelerator) (Accessed 25 June 2020).
- 72 Deng, C. (2020). In Race for Covid-19 Vaccine, China Tries for a Coup. [online] Wall Street Journal. Available at: <https://www.wsj.com/articles/in-race-for-covid-19-vaccine-china-tries-for-a-coup-11591354803> (Accessed 25 June 2020).

73 Baker, et. al. (2017). Innovation, Intellectual Property, and Development: A Better Set of Approaches for the 21st Century. [online] AccessIBSA. Available at: <https://cepr.net/images/stories/reports/baker-jayadev-stiglitz-innovation-ip-development-2017-07.pdf> (accessed 22 June 2020).

74 Cohen, J.E. (2019). Between Truth and Power: The Legal Constructions of Informational Capitalism. Oxford: Oxford University Press.

75 One starting point for designing how public commons' could be governed is Nobel Prize winning Economist Elinor Ostrom's "8 Principles for Managing a Commons." See: Walljasper, J. (2011). Elinor Ostrom's 8 Principles for Managing a Commons. [online] On the Commons. Available at: <https://www.onthecommons.org/magazine/elinor-ostroms-8-principles-managing-commmons> (Accessed 25 June 2020).

76 Traditionally the military (especially the US Defense Department) has played a prominent role in channeling and directing public R&D investments according to real and perceived national security threats – and in many cases, the inventions resulting from these investments have had significant civilian applications and consumer benefit. However, other than political expediency, there is no inherent reason why the military should be the (or a) major vehicle through which public R&D investments are made – especially when many of the threats we face are increasingly global and non-military in nature. Similarly, while there are undoubtedly legitimate and pressing national interests, and economic development should be place-based, there is a clear difference between those interests and the xenophobic and right wing nationalist formulations of national interest being advanced by the Trump and Johnson governments with their America First/Get Brexit Done visions.

77 ACRE, (2020). Poison: How Big PHarma's Racist Price Gouging Kills Black and Brown Folks. [online]. Action Center on Race and the Economy. Available at: <https://acrecampaigns.org/wp-content/uploads/2020/08/POISON-FINAL-DRAFT.pdf> (Accessed 21 August 2020).

78 Tomasetti, J. (2020). "Rebalancing Worker Rights and Property Rights in Digitalised Work" in Carby-Hall, J. and Méndez, L.M. Labour Law and the Gig Economy. New York: Routledge.

79 Foote, C. and Atkinson, R.D. (2018). Dwindling Federal Support for R&D Is a Recipe for Economic and Strategic Decline. [online] Information Technology & Innovation Foundation. Available at: <https://itif.org/publications/2018/12/14/dwindling-federal-support-rd-recipe-economic-and-strategic-decline> (Accessed 25 June 2020).

80 House of Commons Library (2020). Research and development spending. [online] Available at: <https://commonslibrary.parliament.uk/research-briefings/sn04223/#:~:text=In%202018%2C%20it%20funded%20%C2%A3,%2C%2026%25%20of%20the%20total> (Accessed 25 June 2020).

81 EPSRC (2018). Engagement on government commitment to boost R&D spending to 2.4% GDP. [online] University College London. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/engagement-on-government-commitment-to-boost-rd-spending_dr-matthew-davis.pdf (Accessed 23 July 2020).

82 Hwang, R. (2020). Ten Years to Act Is Ten Years Too Late. [online] NRDC. Available at: <https://www.nrdc.org/experts/roland-hwang/ten-years-act-ten-years-too-late> (Accessed 24 August 2020).

83 Similar to our recommendations in this paper around reparations and technology transfers, the report also suggests that one of the keys to tackling climate change is to develop cheap clean energy technology and share it with the rest of the world. "Cheaper clean energy technology is a global public good, and advanced economies are both morally obliged and economically well-positioned to provide it," David Roberts writes. See: Roberts, D. (2019). The climate change policy with the most potential is the most neglected. [online] Vox. Available at: <https://www.vox.com/energy-and-environment/2019/7/11/20688611/climate-change-research-development-innovation> (Accessed 24 August 2020).

84 Roberts, D. (2019). The climate change policy with the most potential is the most neglected. [online] Vox. Available at: <https://www.vox.com/energy-and-environment/2019/7/11/20688611/climate-change-research-development-innovation> (Accessed 24 August 2020).

85 Mazzucato, M. and Macfarlane, L. (2019). A mission-oriented framework for the Scottish National Investment Bank/ Institute for Innovation and Public Purpose https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/mission-oriented-framework-for-snib_final.pdf (Accessed 23 July 2020)

86 In the case of Scotland's national investment bank, its primary mission is the "transition to net-zero." See: The Scottish Government (no date). Growing the Economy: Scottish National Investment Bank. [online] Available at: <https://www.gov.scot/policies/economic-growth/scottish-national-investment-bank/#:~:text=many%20European%20countries,-,In%20the%20Programme%20for%20Government%202017%20to%202018%2C%20the%20First,a%20Scottish%20National%20Investment%20Bank.&text=We%20provided%20%C2%A3130%20million,21%20for%20the%20same%20purpose> (Accessed 24 August 2020).

- 87 Laplane, A. and Mazzucato, M. (2019). Socialising the risks and rewards of public investments: Economic, policy and legal issues. [online] University College London. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/socialising_risks_and_rewards_final.pdf (Accessed 23 July 2020).
- 88 Fair Tax (2020). Home. [online] Available at: <https://fairtaxmark.net/>.
- 89 IPO (2016). Corporate Plan 2017-2020. [online] Intellectual Property Office. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/607989/IPO-Corporate-Plan-2017-2020.pdf (Accessed 24 August 2020).
- 90 This would undoubtedly require significant changes in how the IPO and USPTO operate. In the US context, NYU law professor Christopher Morten, suggests that adopting these proposals may require the USPTO to hire new staff that have a broader understanding of the common good (beyond their narrow subject area expertise) and/or put patent and trademark applications through a double system of review – a first to figure out if an application meets existing basic requirements, then a second to apply the SROI (or some similar) framework. Morten, C. (2020). Email correspondence with authors. August 10, 2020.
- 91 NEF Consulting (2020). Social Returns on Investment. [online] New Economics Foundation. Available at: <https://www.nefconsulting.com/our-services/evaluation-impact-assessment/prove-and-improve-toolkits/sroi/> (Accessed 23 July 2020).
- 92 In terms of the latter, for instance see: Morten, C.J. and Kapczynski, A. (2019). United States v. Gilead: Can a Lawsuit Yield Better Access To PrEP? [online] Health Affairs. Available at: <https://www.healthaffairs.org/doi/10.1377/hblog20191118.218552/full/> (Accessed 16 August 2020).
- 93 Hanna, T.M. (2019). A History of Nationalization in the United States: 1917-2009. [online] Next System Project. Available at: <https://thenextsystem.org/history-of-nationalization-in-the-us> (Accessed 23 July 2020).
- 94 Just Treatment (2019). Enacting a Crown use licence to secure access to affordable lumacaftor-ivacaftor (Orkambi) for UK cystic fibrosis patients. [online] Available at: <https://static1.squarespace.com/static/5947bb9ee6f2e17ea4cf8050/t/5c547bea9b747a45e29f61bc/1549040620002/Technical+submission+for+government+on+Orkambi+for+MPs+etc.pdf> (Accessed 23 July 2020).
- 95 Laplane, A. and Mazzucato, M. (2019). Socialising the risks and rewards of public investments: Economic, policy and legal issues. [online] University College London. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/socialising_risks_and_rewards_final.pdf (Accessed 23 July 2020).
- 96 Watzinger, M. et. al. (2017). How Antitrust Enforcement Can Spur Innovation: Bell Labs and the 1956 Consent Decree. [online] American Economic Association. Available at: https://economics.yale.edu/sites/default/files/how_antitrust_enforcement.pdf (Accessed 5 August 2020).
- 97 McCann, D. (2020). Commoning Intellectual Property: Public funding and the creation of a knowledge commons. [online] Common Wealth. Available at: <https://www.common-wealth.co.uk/reports/commoning-intellectual-property> (Accessed 5 August 2020).
- 98 OECD (2010). SMEs, Entrepreneurship and Innovation. [online] Available at: <http://www.oecd.org/cfe/smesentrepreneurshipandinnovation.htm> (Accessed 23 July 2020).
- 99 Yin, D. (2017). What Makes Israel's Innovation Ecosystem So Successful/ [online] Forbes. Available at: <https://www.forbes.com/sites/davidyin/2017/01/09/what-makes-israels-innovation-ecosystem-so-successful/#632d19e070e4> (Accessed 23 July 2020).
- 100 Finnvera (no date). Finneva in Brief. [online] Available at: <https://www.finnvera.fi/eng/finnvera/finnvera-in-brief> (Accessed 23 July 2020).
- 101 Mazzucato, M. and Macfarlane, L. (2018) State investment banks and patient finance: An international comparison, UCL https://marianamazzucato.com/wp-content/uploads/2019/01/iipp_wp_2018-01.pdf
- 102 Venture Fund (no date). Venture Fund. [online] TEDCO. Available at: <https://www.tedcomd.com/funding/venture-fund> (Accessed 5 August 2020).
- 103 Division of State Documents (no date). Venture Fund. [online] Maryland.gov. Available at: http://www.dsd.state.md.us/COMAR/SubtitleSearch.aspx?search=14.04.06.* (Accessed 5 August 2020).
- 104 Corporate Europe (2019). How Big Pharma Sabotaged the Struggle for Affordable Cancer Treatment. [online] Available at: <https://corporateeurope.org/sites/default/files/2019-06/Novartis%20vs%20Colombia.pdf> (Accessed 23 August 2020).

- 105 UK Labour (2019). Medicines for the Many: Public Health before Private Profit. [online] Available at: <https://labour.org.uk/wp-content/uploads/2019/09/Medicines-For-The-Many.pdf> (Accessed 23 August 2020).
- 106 Just Treatment (2019). Enacting a Crown use licence to secure access to affordable lumacaftor-ivacaftor (Orkambi) for UK cystic fibrosis patients [online] Available at: <https://static1.squarespace.com/static/5947bb9ee6f2e17ea4cf8050/t/5c5d45529b747a56e070c9fc/1549616470365/Technical+submission+for+government+on+Orkambi+%281%29.pdf>
- 107 Hoen, E. (2016). Private Patents and Public Health. [online] Public Health International. Available at: <https://haiweb.org/wp-content/uploads/2016/07/Private-Patents-Public-Health.pdf> (Accessed 23 August 2020).
- 108 This framework would ascertain the criteria for deployment of the Crown use licence, including price, supply, need. etc.
- 109 Mr Adrian Bailey in the Chair (2019) Cystic Fibrosis Drugs: Orkambi, Westminster Hall Debate. [online] House of Commons. Available at: <https://www.theyworkforyou.com/whall/?id=2019-06-10a.199.0#g234.1> (Accessed 23 August 2020).
- 110 Department for Business, Energy and Industrial Strategy (2020). Funding and manufacturing boost for UK vaccine programme (2020). [online] Available at <https://www.gov.uk/government/news/funding-and-manufacturing-boost-for-uk-vaccine-programme> (Accessed 23 August 2020);
- 111 Global Justice Now (2020). Patients call on AstraZeneca to make coronavirus vaccine patent-free. [online] Available at: <https://www.globaljustice.org.uk/news/2020/jun/2/patients-call-astrazeneca-make-coronavirus-vaccine-patent-free> (Accessed 23 August 2020).
- 112 Brown, D. (2019). Medicine For All: The Case for a Public Option in the Pharmaceutical Industry. [online] Next System Project. Available at: <https://thenextsystem.org/medicineforall> (Accessed 5 August 2020).
- 113 WIPO Expert Forum on International Technology Transfer (2018) WIPO https://www.wipo.int/meetings/en/details.jsp?meeting_id=35562
- 114 South Centre Statement to the Eighteenth Session of the World Intellectual Property Organization's (WIPO) Committee on Development and Intellectual Property (CDIP) (2016) South Centre https://www.southcentre.int/wp-content/uploads/2016/11/161031_SC-statement-to-WIPO-CDIP-18th_EN.pdf
- 115 Nirmalya, S. et. al. (2020). The 73rd World Health Assembly and Resolution on COVID-19: Quest of Global Solidarity for Equitable Access to Health Products. [online] South Centre. Available at: <https://www.southcentre.int/policy-brief-78-may-2020/#more-14401> (Accessed 5 August 2020).
- 116 Lawson, M. (2020). Coronavirus is killing the poor far more than the rich. A vaccine must be free for everyone. [online] Global Justice Now. Available at: <https://www.globaljustice.org.uk/blog/2020/may/19/coronavirus-killing-poor-far-more-rich-vaccine-must-be-free-everyone> (Accessed 4 August 2020).
- 117 Hernández-Morales, A. (2020). Germany Confirms That Trump Tried to Buy Firm Working on Coronavirus Vaccine. [online] Politico. Available at: <https://www.politico.eu/article/germany-confirms-that-donald-trump-tried-to-buy-firm-working-on-coronavirus-vaccine/> (Accessed 23 July 2020); Mulier, T. (2020). U.K. Orders 90 Million Covid-19 Vaccine Doses from Pfizer, Valneva. [online] Bloomberg. Available at: <https://www.bloomberg.com/news/articles/2020-07-20/u-k-orders-90-million-vaccine-doses-from-pfizer-valneva> (Accessed 23 July 2020); Baragona, S. (2020). Health Authorities Aim to Build Alternative to COVID-19 Nationalism. [online] Voice of America. Available at: <https://www.voanews.com/covid-19-pandemic/health-authorities-aim-build-alternative-covid-19-nationalism> (Accessed 20 July 2020); Guarascio, F. (2020) Exclusive: EU in Talks with Moderna, BioNtech, CureVac to Secure Possible COVID Vaccines. [online] Reuters. Available at: <https://www.reuters.com/article/us-health-coronavirus-eu-vaccines-exclus-idUSKCN2411HA> (Accessed 20 July 2020).
- 118 Cha, S., Rinke, A., and Smout, A. (2020). World takes stock of COVID-19 drug remdesivir after U.S. snaps up supplies. [online] Reuters. Available at: <https://www.reuters.com/article/us-health-coronavirus-remdesivir/world-takes-stock-of-covid-19-drug-remdesivir-after-u-s-snaps-up-supplies-idUSKBN2426ZG> (Accessed 16 August 2020).
- 119 Hammond, E. (2020). Intellectual Property Lawsuit Holds Back Production of COVID-19 Vaccine Candidate. [online] Third World Network. Available at: https://twm.my/title2/intellectual_property/info.service/2020/ip200602.htm (Accessed 23 June 2020).
- 120 Garde, D. (2020). Ruling Threatens to Upend Patents on Moderna's Covid-19 Vaccine. [online] STAT. Available at: <https://www.statnews.com/2020/07/23/ruling-threatens-to-upend-patents-on-modernas->

[covid-19-vaccine/](#) (Accessed 23 August 2020).

121 Worley, W. (2020). WHO and Costa Rica Launch COVID-19 Technology Access Pool. [online] Devex. Available at: <https://www.devex.com/news/sponsored/who-and-costa-rica-launch-covid-19-technology-access-pool-97368> (Accessed 23 June 2020).

122 Newey, S. (2020). WHO Patent Pool for Potential Covid-19 Products Is 'Nonsense', Pharma Leaders Claim. [online] The Telegraph. Available at: <https://www.telegraph.co.uk/global-health/science-and-disease/patent-pool-potential-covid-19-products-nonsense-pharma-leaders/> (Accessed 23 June 2020).

123 Nuki, P. and Newey, S. How China Has Emerged as a Front Runner in Race to Start Human Trials for Covid-19 Vaccine. [online] The Telegraph. Available at: www.telegraph.co.uk, <https://www.telegraph.co.uk/global-health/science-and-disease/front-runner-60-per-cent-human-vaccine-trials-covid-19-china/> (Accessed 23 June 2020).

124 UNCTAD (2011). Using Intellectual Property Rights to Stimulate Pharmaceutical Production in Developing Countries. [online] Available at: https://unctad.org/en/Docs/diaepcb2009d19_en.pdf (Accessed 5 August 2020).