


SYMPOSIA PAPER

# Pandemic science and commercial values: An institutional account of values in science

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## Abstract

The different social institutions involved in the development and distribution of science and technology tend to promote, primarily, commercial and private interests, even in situations with high social stakes. Acknowledging how these interests interplay with social and epistemic values is fundamental for understanding the role of values in science today. To show this, I use the global pandemic and the race to develop and distribute vaccines against COVID-19 as an example. I argue that a mere circumstantial alignment of values across the social institutions of science is not enough and that instead we need a more *substantive* alignment.

## 1. Introduction

The roles for values in science are certainly not constrained to decisions made by individual scientists. Institutions also can, and in fact do, play an important role in promoting or hindering certain values in scientific research. Funding institutions, such as private companies or government agencies, can value certain lines of research or topics, for example, applied research over basic research, or they can value certain researchers, for example, researchers working in certain countries or in certain universities, over others. Regulatory institutions can value certain ways of organizing scientific research, for example, through intellectual property law, supporting patents or antitrust law over other arrangements. Political institutions can steer the public conversation to focus on certain scientific questions or debates over others, valuing them as socially and politically significant while ignoring or deflecting others. Academic institutions can organize their research structure valuing certain practices, such as interdisciplinary collaborations, publications in highly ranked journals, grant applications, and so forth. Thus, social institutions can have a significant influence on the values that end up shaping scientific research.

As I have suggested before (Fernández Pinto 2020), acknowledging that scientific research today is mainly conducted in the private sphere with commercial interests (or values) in mind becomes crucial for understanding the roles of values in science today, as well as to imagining ways of counteracting some of the undesirable

influence of such values. In this article, I argue in this direction, showing that the different social institutions involved in the development and distribution of COVID-19 vaccines tended to promote, primarily, commercial and private interests, even in a situation with high social stakes. In particular, I focus on the institutional frameworks in which vaccines were developed and distributed, highlighting how commercial values interacted with epistemic and social values. I argue that a mere circumstantial alignment of values across the social institutions of science is not enough and that instead we need a more *substantive* alignment.

With this purpose, the article is divided into five sections. In section 2, I introduce an institutional account of values in science, clarifying what I mean by social institutions and examining the ways in which different social institutions are involved in research and development (R&D) today. Section 3 introduces the example of scientific and technological development during the COVID-19 global health emergency, analyzing the way in which different social institutions collaborated during a first phase, that is, in the development of efficient vaccines. In contrast, section 4 analyzes how the same social institutions reacted during a second phase, that is, once the vaccines were available and ready to be distributed. I argue that, while in the first phase commercial values could be seen as fostering the epistemic and social aims of science, concentrating research efforts to develop quick and efficient vaccines, in the second phase, commercial values seem to have obstructed such epistemic and social aims, for example, when negotiating vaccine distribution in low- and middle-income countries (LMICs). I then argue that even in the case in which commercial interests seem to be well aligned with the social and epistemic aims of vaccine research, as during the first phase, such alignment is circumstantial at best. To conclude, I reiterate that the institutional framework is crucial for understanding the values embedded in pandemic science, as well as in many other research endeavors today.

## 2. Social institutions and values in science

This section aims to present a sketch of an institutional account of values in science. As scholars have argued (e.g., Blondel 2006; Hecló 2008, 46–51), the term “social institution” is multifaceted and context-dependent, and thus it is not used consistently in ordinary language, in philosophy, or across the social sciences. Drawing from contemporary sociology, which seems to have a more stable use of the term, in this article, “social institution” refers to:

a complex of positions, roles, norms and values lodged in particular types of social structures and organising relatively stable patterns of human activity with respect to fundamental problems in producing life-sustaining resources, in reproducing individuals, and in sustaining viable societal structures within a given environment. (Turner 1997, 6)

Another, more succinct, definition of the term that captures the main features of the social institutions related to scientific and technological development that are central to this article is Jupille and Caporaso’s definition of “social institutions” as “intertemporal social arrangements that shape human relations in support of particular values” (2022, 3). Following Miller (2019), I also distinguish social institutions from less complex

social forms, such as norms, rules, or conventions, which are constitutive of social institutions but do not amount to social institutions, as well as from more complex social forms, such as societies or cultures, of which social institutions are part. In this sense, typical social institutions are governments, families, legal systems, businesses, universities, religions, and so forth. Social institutions are also frequently, but not always, organizations or systems of organizations (Scott 2001). “Language,” for instance, would be a nonorganizational social institution, while “The Catholic Church,” would count as an organization and “religion” as a system of organizations. This article mainly concerned with social institutions that are also organizations, such as international governance organizations, philanthropic foundations, private companies, and so forth, as well as systems of organizations, such as governments, regulatory systems, corporate businesses, and so forth.

An important aspect of introducing an institutional framework to the philosophy of science is the role of values. As the previous definitions explicitly state, social institutions support, promote, or capture certain values. According to Jupille and Caporaso: “Our point is that institutions are never valueless, value-free, or value-innocent and that this property arises not empirically but is baked into what they are” (2022, 6). Thus, certain social institutions feature or portray certain values, depending on their particular aims, histories, structures, and so forth. And even though a multiplicity of values is always embedded in social institutions, and these values can change over time, we can also identify certain values that certain type of social institutions commonly portray. In this sense, academic institutions, such as universities, tend to portray epistemic and pedagogical values, such as understanding and the search for knowledge; democratic institutions, such as regulatory institutions, tend to promote social values such as inclusion and justice; corporate institutions, such as private companies, commonly support certain economic values, such as profitability and efficiency; and international governance institutions, such as the United Nations, frequently promote global equity values, such as global fairness, global welfare, and development.

Science, understood as a social institution, also tends to feature certain values. Science is fundamentally an epistemic institution for its aims are always related to the search for knowledge (Goldman 2011). But science is also a *social* institution not only in the sense that it is collectively constituted but also in the sense that it seeks to promote the common good, that is, science is an institution that works for society. This understanding of science as a socially driven institution has been emphasized in the last decades by philosophers working on the social epistemology of science, such as Douglas (2009), Kourany (2010), Longino (1990), Rouse (1987), and Solomon (2001), but it has older roots in the works of American pragmatists, such as Dewey, and some of the philosophers of the Vienna Circle, such as Neurath (Reisch 2005). As a social institution, science also portrays certain values, such as empirical adequacy and social benefit.

In the twenty-first century, science does not work in social isolation. In most cases, scientific research happens due to a series of intricate and complex interrelations among a number of social institutions that drive, limit, and channel research endeavors. Governmental and private institutions both serve as funding institutions for scientific research; regulatory institutions provide the legal framework to buttress or limit scientific research, for example, through intellectual property law; academic institutions organize their research structure, valuing certain research practices over others, for example, encouraging interdisciplinary projects or international

collaborations; and international institutions encourage the development of certain lines of research for global equity, while signaling the dangers of others. All in all, the production of scientific knowledge and its implementation occurs in a complex network of social institutions.

In this article, I focus on the values portrayed by the social institutions related to science and how they interplay. I use the COVID-19 pandemic and the global development and distribution of vaccines as an example. This context of pandemic science is a good example of how the production of technoscientific knowledge and its distribution occurs in a complex network of social institutions, each with its own values. Accordingly, to understand the values of pandemic science, we need to understand the institutional network behind it and the interaction among the different institutional values.

### 3. The global pandemic and the need for vaccines

The production and distribution of vaccines that took place during the recent global pandemic gives us a unique and timely example of global scale institutional interaction for R&D of new technologies. I am interested in the interplay of institutional values in two phases. During the first phase, presented in this section, efforts focused on the production of scientific and technological knowledge to procure COVID-19 vaccines in the beginning of the pandemic (roughly March 2020–December 2020). During the second phase, presented in the next section, efforts shifted toward the circulation of such knowledge, which in this case is related to the global distribution of vaccines after their successful development (roughly December 2020–today).

On March 11, 2020, the Director-General of the World Health Organization (WHO), Dr. Tedros Adhanom Ghebreyesus, declared COVID-19 a pandemic, that is, an epidemic of an infectious disease of global proportions. Two months before that, on January 11, 2020, the genetic sequence of SARS-CoV-2 became available, leading to an intense global research effort to find a vaccine. On April 2020, the COVID-19 vaccine R&D landscape included already 115 candidates, 73 on preclinical stages and 5 already on Phase 1 trials (Le et al. 2020a). In September 2020, vaccine candidates had tripled. The COVID-19 vaccine R&D landscape now included 321 candidates, 33 on clinical trials (with plans to recruit more than 280,000 participants in 34 countries) and 6 already on Phase 3 trials (ibid.).

Vaccine developers included academic institutions, private companies (biotechnology startups and private research centers), public research organizations, NGOs, and, increasingly, multinational pharmaceutical companies (Le et al. 2020b, 668). As of April 2020, private companies were developing the majority (72 percent) of confirmed active vaccine candidates, while the remaining 28 percent were being developed in academic, public, or nonprofit organizations (ibid.). With some exceptions (e.g., Janssen and Pfizer), the leading vaccines developers were not big pharmaceutical companies, but rather small and inexperienced biotech startups and research centers (Hooker and Palumbo 2020). It was only later, by September 2020, that multinational pharmaceutical companies became properly involved in the efforts of vaccines development (Le et al. 2020b).

A huge global institutional effort was put in place to develop the desperately needed vaccines to fight COVID-19. Governments, private companies, universities,

NGOs, philanthropic foundations, and international organizations joined efforts. As R&D global leaders, the United States and the European Union heavily invested in vaccine research projects. Early 2021, the US government had already allocated more than 12 billion USD to vaccine development through their Operation Warp Speed (Barone 2020) and the European Union had contributed more than 3 billion USD to the same cause (European Commission 2021). As of December 2020, the most successful vaccine projects had received major contributions from taxpayers. Moderna and Novavax, for example, were mainly developed through direct contributions from government, but most vaccine projects received some sort of public funding (Hooker and Palumbo 2020). Donors, such as the well-known US actress Dolly Parton, and philanthropic organizations, such as the Bill and Melinda Gates Foundation, also made important contributions to the cause (Wouters et al. 2021).

WHO was also a key player in coordinating research efforts to develop COVID-19 vaccines, consolidating and centralizing key information of vaccine development projects, and leading the COVAX initiative, a global platform to support the development and manufacturing of vaccine candidates and later negotiate their pricing so that the most vulnerable countries, that is, those with the least bargaining power, would not be left behind in the vaccination process (Berkley 2020). And last, but not least, LMICs, which didn't have the research capabilities of leading vaccine development projects, made key contributions to clinical trials. Argentina, Brazil, Chile, Colombia, India, Mexico, Pakistan, and South Africa, served as locations for Phase I, II, and III trials in COVID-19 vaccine development (Le et al. 2020b, suppl. Table 1).

In sum, during the first phase of the pandemic, the moment in which there was an imminent threat from COVID-19, and where the need of an efficient vaccine was unmistakable, all the relevant social institutions joint efforts to produce the needed scientific knowledge and technological development. In this scenario, we see a historically crucial, but (as will become clear later) also circumstantial, alignment of epistemic, social, and commercial values. The ethical and epistemic values of research institutions, that is, the search for knowledge in the form of safe and efficient vaccines, the social values of governmental and nongovernmental institutions, that is, the common good in the form of national and global health, and the commercial values of pharmaceutical companies and startups, in the form of potentially profitable and marketable products, all worked in the same direction, or were properly aligned, to achieve a successful portfolio of vaccines to fight the global pandemic.

#### 4. The global distribution of COVID-19 vaccines

A different scenario arose, however, once the technoscientific knowledge was achieved and the vaccines were ready for massive production and distribution. The intricate network of collaborative relations that was promptly weaved for the development of vaccines to fight COVID-19 transformed very quickly into a "winner takes all" situation, in which those institutions with the largest bargaining power quickly moved to assure their self-interest. In this sense, the previous alignment of epistemic, social, and commercial values proved to be merely circumstantial. Once the context changed, the different institutions started pulling in their own direction. While WHO and other international NGOs continued to advocate for COVAX, as a key

mechanism to ensure vaccine coverage for all, especially the most vulnerable, governments in rich countries and multinational pharmaceutical companies rapidly started to negotiate their own Advanced Market Commitments (AMCs) and Advanced Purchase Agreements (APA) to guarantee vaccine coverage for their citizens.

The most powerful states were able to secure the largest supplies. In early December 2020, around half the available doses (51 percent), were already allocated to high-income countries (HICs) representing only 14 percent of the global population. And some nations even started hoarding vaccines. The United Kingdom and Canada, for instance, preordered, respectively, two and four times the doses needed to vaccinate all their citizens (So and Wo 2020). Cases of *vaccines nationalism* started to appear. Vaccine manufacturing countries started to impose export bans to ensure local supply at the expense of global coverage (Evenett 2021). In March 2021, for example, the European Union retained 250,000 doses of AstraZeneca vaccines going to Australia, to ensure that their local needs were fulfilled first (The Economist 2021).

Middle-income countries, who were not eligible for COVAX free doses, were then forced to enter a bargaining competition in which they had no real negotiating power, spending hundreds of millions of dollars to vaccinate their citizens. Most of the actual prices paid to pharmaceutical companies are not public, given that negotiations are made under confidentiality agreements, but some information has been uncovered. For instance, according to *Bloomberg*, the Colombian government spent approximately 1 billion dollars on vaccine doses and paid 300 million dollars for 10 million doses of Moderna at 30 dollars a dose, almost double of what the pharmaceutical company charged the US government (Paton and Lauerman 2021).

In October 2020, India and South Africa filed a petition to the World Trade Organization (WTO) to temporarily suspend intellectual property (IP) rights related to COVID-19 under the Trade-Related Aspects of Intellectual Property (TRIPS), the agreement that regulates IP rights in international trade (Usher 2020). While several LMICs supported the proposal, HICs were quick to reject it, arguing that the IP system is necessary to encourage R&D. An EU representative claimed that: “There is no evidence that IP rights in any way hamper access to COVID-19-related medicines and technologies” (ibid., 396). Despite mounting evidence to the contrary, presented by Indian and South African representatives, including IP related legal battles, such as the one between Pfizer and Doctors Without Borders in India over the patent of a pneumococcal vaccine that has impeded the development of alternatives (ibid.), the proposal was not successful.

Allegedly, TRIPS already contemplates public emergencies scenarios, in which IP rights could be relaxed. Among these “TRIPS Flexibilities” is Article 31: “Where the law of a Member allows for other use of the subject matter of a patent without the authorization of the right holder” (WTO 1994), that is, under certain circumstances “a WTO member is allowed to grant a compulsory license to a pharmaceutical company within its jurisdiction either to manufacture or import a patented pharmaceutical product” (Chimpango 2021). However, many countries have been reluctant to adopt such measures due to the legal consequences of such actions (Mitchell and Voon 2009; Oguanobi 2018). As Chimpango explains, “The USA places countries that are deemed to be in breach of IP rules on a Watch List or Priority Watch List. Countries that are on the Priority Watch List may be subject to an investigation and potentially trade sanctions” (2021, 175). And, in fact some countries have faced litigations and sanctions

in the past due to compulsory licensing (McHanon 2021, 145). Accordingly, compulsory licenses have not been used as widely as expected to ensure access to COVID-19 vaccines and treatments.

In this scenario, and despite all the attention given to decisions of national governments, the role of private companies together with the legal framework of international IP rights become centerstage. After all, the development of COVID-19 vaccines followed the organization of scientific research that was already prevalent before the pandemic, with private companies leading technoscientific innovation for commercial gain. As I have previously argued:

The globalized privatization of science has become even more salient as multinational pharmaceutical companies receive tax-payer money from different states, conduct international clinical trials, and then negotiate independently and confidentially with each national government to make a profit from their vaccines in a time of crisis. (Fernández Pinto 2022, 3)

If anything changed in this particular case, it was the political and social interests behind powerful national governments to incentivize the rapid production of vaccines to fight the pandemic, leading to an injection of public capital in a portfolio of promising private ventures. Despite this, pharmaceutical companies obtained patent protection for the vaccines being developed, and once they were capable of producing safe and efficient vaccines at a large scale, they were covered by IP law to negotiate sales independently to each interested customer/country. And so, they did, starting with the national governments whose citizens had financed the vaccine's R&D in the first place.

Globally, the pharma giants who produced a marketable vaccine on time (initially Pfizer, Aztra-Seneca, Moderna, Sinovac, and Janssen) started negotiations under confidentiality agreements at a global scale, but independently with each interested nation. As I mentioned already, the result was a rather opaque process. Some pharmaceutical companies, such as Aztra-Seneca and Janssen, pledged to sell their vaccines at cost, while others, such as Moderna and Pfizer, were striving to make a profit for their shareholders. As a result, vaccines prices have varied widely among sellers, Aztra-Seneca's starting at 4 and Moderna at 25 dollars, but also among buyers of the same vaccine, a shot of Sinovac's vaccine, for example, was sold as cheap as 14 or as expensive as 30 dollars (Hooker and Palumbo 2020). The lack of transparency in the process gave pharmaceutical companies privileged information that their negotiating partners did not have, leading to bargaining asymmetries that in many cases benefited commercial interests over the common good. Or, even in the cases in which it didn't, for example if some vaccines were sold at cost globally, the decision to value the common good over commercial gain was made entirely by the private companies holding the vaccine patents and not by any democratic government or international governance organization.

In sum, during the second phase of the pandemic, the moment in which safe and efficient vaccines became available, and pharmaceutical companies had patent protection to negotiate prices, the joint and global efforts of social organizations crumbled. Pharmaceutical companies, under IP regulations, enforce their trading power in favor of their commercial interests. Powerful governments in HICs valued more the well-being of their own citizens over the most vulnerable, that is, poor

citizens in LMICs, which led to vaccine hoarding and vaccine nationalism. International organizations, such as WHO, promoted the COVAX mechanism with the hope of guaranteeing some coverage for those least favored, and kept insisting that for the proper handling of the pandemic, vaccine distribution needed to be global. National governments in LMICs were left adrift to negotiate with powerful pharmaceutical companies their vaccine coverage, without any help of international governance organizations, such as WTO, or national governments in high-income countries, which could have contributed with relaxing IP laws to “level the field.” As a result, many of these countries are more in debt than ever before, and pharmaceutical companies are making record sales (Paton and Lauerman 2021). In this scenario, we see no alignment of epistemic, social, and commercial values, but rather tensions with institutions pulling apart in their own self-interested directions.

If institutional values were working on the same direction during the first phase of the pandemic, this alignment was not substantive, but circumstantial. In other words, the alignment was not grounded on a firm basis, was not genuine or truly meaningful, but rather emerged incidentally and provisionally. Once the circumstances changed, the initial alignment was lost.

## 5. Conclusion

During the first phase of the pandemic the commercial, epistemic, and social interests of different social institutions became properly aligned to successfully achieve the development of safe and efficient vaccines to combat COVID-19. This alignment led to the timely production of the relevant technoscientific knowledge, but once vaccines became available it crumbled rapidly. Different social institutions had very different interests in pursuing and supporting the development of COVID-19 vaccines, but such interests only became evident once questions of vaccine distribution arose. Pharmaceutical companies had clear commercial interests that were ensured through existing IP law, HICs and international organizations, such as WTO, supported both the current IP regime, especially TRIPS, and were quick to ensure vaccine doses for their own citizens in the detriment of global coverage. Other international organizations, such as WHO, emphasized the social inequalities embedded in the vaccine production and distribution processes, and urged to guarantee vaccine coverage for the most vulnerable populations worldwide. LMICs expressed their concerns with maintaining current IP law, especially TRIPS, during a global pandemic, but their negotiations were unsuccessful. In the end, they were left on their own to negotiate deals with multinational pharmaceutical companies, which in turn cost them a disproportionate increase in their international debt and left them even worse off than they started. In sum, the organization of R&D during the global pandemic maintained the same commercial framework that was already in place before 2020, and the social institutions, such as governments in high-income countries and the WTO, which had the power of introducing the relevant changes, even if temporarily, did nothing about it. As a result, I would argue, pandemic science, and in particular the search for COVID-19 vaccines, in the way it was conducted, contributed to deepen global social inequalities.

In conclusion, the temporary alignment of institutional values was certainly conducive to the production of some technoscientific knowledge, but it was definitely not conducive to the proper confrontation of global challenges during the COVID-19



pandemic. Although value alignment across the relevant institutions is an important requirement for achieving and preserving the social and epistemic goals of commercially driven research (Fernández Pinto 2018), the analysis in this article further shows that circumstantial value alignment is not enough, and that a more *substantive* alignment across institutional values is needed. This would require the deliberate coordination of values across the relevant institutions, that is, agreeing upon common interests, and committing to maintaining such agreements for a certain period of time. This could mean, among other things, that to procure stronger and more durable alignments of institutional values, explicit efforts should be put in place (e.g., through interinstitutional agreements), so that the collaboration remains despite contextual changes. Accordingly, the institutional analysis of values in the case of scientific knowledge production and distribution of COVID-19 vaccines uncovers the need to develop a more nuanced account of institutional values in science, as well as a more detailed exploration of the strength or weakness of different value alignments across the institutions of science.

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