Facing the Pandemic in Brazil: controversies surrounding "early treatment" and vaccination

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Abstract

The article investigates the controversies that emerge with the production of the CoronaVac vaccine, the first Covid-19 vaccine available in Brazil, on June 11th, 2020. Based on Actor-Network Theory, this study is inspired by virtual ethnography. We thus privilege digital documents from government agencies and medical entities, specialized publications, publications in Facebook groups, and the writing of a virtual field diary. Our investigation ends with the approval of the CoronaVac and Oxford/AstraZeneca vaccines by the National Health Surveillance Agency (Anvisa). We identify the construction of factoids by groups that were critical of social distancing measures, basing themselves on the use of purportedly scientific arguments. The alliances established between doctors and the federal government through the Ministry of Health challenged the vaccine as a technoscientific artifact, and advocated for drugs that were part of the so-called "early treatment" as the "cure" for the pandemic in Brazil.

Keywords: Covid-19; Controversies; Early treatment; CoronaVac; Socioanthropology.

e19903
http://doi.org/10.1590/1809-43412022v19e903

O Enfrentamento à Pandemia no Brasil: controvérsias em torno do "tratamento precoce" e da vacinação

Resumo

O artigo investiga as controvérsias que emergem com a notícia do início da produção da primeira vacina contra a Covid-19 no Brasil, a CoronaVac, em 11 de junho de 2020. Apoiando-se na perspectiva da Teoria Ator-Rede, realiza-se um estudo com inspiração na etnografia virtual. Assim, privilegiam-se documentos digitais de órgãos governamentais e entidades médicas, matérias jornalísticas, publicações em grupos da rede social *Facebook* e escrita de diário de campo virtual. A investigação é finalizada com a aprovação das vacinas CoronaVac e Oxford-AstraZeneca pela Agência Nacional de Vigilância Sanitária. O estudo identifica a construção de factóides por grupos críticos ao distanciamento social, tendo como base o acionamento de argumentos pretensamente científicos. Identifica-se que as alianças estabelecidas entre médicos e o governo federal por meio do Ministério da Saúde procuraram desestabilizar a vacina, enquanto artefato tecnocientífico, performando medicamentos do chamado "tratamento precoce" como a "cura" para a pandemia no Brasil.
Palavras-chave: Covid-19; Controvérsias; Tratamento precoce; CoronaVac; Socioantropologia.

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Introduction

At the start of 2020, the world watched, stunned as a new virus, SARS-CoV 2[1] and the Covid-19[2] disease it causes, rapidly spread throughout the globe. The first case of the disease was reported in December of 2019 in Wuhan, capital of Hubei Province, in central China. A number of measures to contain the virus were immediately discussed. First and foremost was the use of medications and the production of a vaccine. Since the very first reports of the virus, it became clear that drugs used for other diseases would need to undergo further controlled testing, as research also targeted the production of new drugs and vaccines. A further measure, backed by the World Health Organization (WHO) was a common protocol during times of pandemic: restrictions on the circulation of people through social distancing or quarantine. Yet this measure was subject to harsh criticism and bitter reactions, raising allegations that it would cripple the economy and generate more deaths, ultimately proving more deadly than the virus itself.

Among the studies and tests carried out worldwide on drugs that might be used for treating Covid-10 was "Hydroxychloroquine and azithromycin as a treatment of Covid-19: results of an open-label non-randomized clinical trial", derived from research coordinated by the Méditerranée Infection University Hospital Institute in Marseille and published in March 2020 (Gautret et al., 2020). The study popularized the use of drugs such as chloroquine and hydroxychloroquine as treatments for Covid-19 in various countries, including the United States and Brazil (Corrêa et al., 2020). These drugs, long used in treating malaria and other diseases, became the focus of research on their efficacy in treating the symptoms of Covid-19. According to Correa et al's survey of data from clinical trials, there were 469 clinical trials against Covid-19 registered worldwide by the 13th of April 2020, some 20% of which (68 studies) involved the use of hydroxychloroquine and chloroquine in treating the disease. Only one study, however, "Efficacy and Safety of Hydroxychloroquine for Treatment of Covid-19", carried out between the 6th and 25th of February in Shangai, involving 30 patients, had been concluded at that time. The study revealed "the importance of using the drug to reduce the viral load, but it did not reach conclusions on its possible impacts viz mortality and hospitalization rates" (Corrêa et al., 2020: 8).

Since the start of the pandemic, the WHO's has sought to contain the virus through detection, testing, isolation, and tracing, thereby avoiding community transmission, while also underscoring that each country is free to develop its own protocols (OPAS, 2020). In March 2020, the WHO initiated a collaborative global study called "Solidarity", which investigated the efficacy of four drug treatments for Covid-19, among which was

1 Severe Acute Respiratory Syndrome Coronavirus 2.

2 Coronavírus Disease 19.

hydroxychloroquine[3]. However, by June 2020 the study had dropped hydroxychloroquine from clinical trials in hospitalized patients since it was not delivering the expected results.

Even in the absence of consolidated scientific results confirming the efficacy of the above-mentioned drugs in treating Covid-19, heads of state such as Donald Trump and Jair Bolsonaro advocated for their use as a solution for the propagation of the virus. On the 19th of March, the then-president of the United States, Donald Trump, defended the use of chloroquine[4] in the treatment of Covid-19 patients. On the 21st of March, Jair Bolsonaro announced that he would "ensure that the Armed Forces would boost the production of chloroquine" (Bárbara, 2020: 91)[5].

Note that despite a lack of consensus in the biomedical community concerning the use of drugs for "early treatment" [6], or even on the existence of an effective treatment for Covid-19, chloroquine was, from the start, touted by the Brazilian president as a solution for the global sanitary crisis (Nascimento et al., 2020. In an interview to Piauí Magazine, Luiz Henrique Mandetta, the former Health Minister, who was fired on the 16th of April 2020, stated that Bolsonaro used chloroquine as a political tool in the hope of economic recovery, all the while diminishing the gravity of the disease by referring to it as a "little flu" (Esteves, 2020).

These early debates were generative of realties and performativities. In this article we will argue that there is a performative aspect to the claim that "early treatment does not need scientific evidence", through agency of different actors, including the federal government. To this end, we will investigate the controversies that stem from news of the production of the first vaccine against Covid-19, known as CoronaVac[7], and trace the arguments that sustain these debates. That is, we will seek to understand how the statement quoted above performs the construction of a *factoid* (Marras, 2020).

For Bruno Latour (2000, 2016), the construction of facts and fictions is diagnostic of the construction of social reality. His interests stem from reflections on the construction of 'society' and 'nature', which are produced during modernity with the help of science. His view is that social anthropological investigation should suspend modern social and natural constructs. Thus, insofar as the aim of this article is to understand how facts and fictions are constructed, it relies on a reform of the hegemonic idea of the social (and the natural) through the exercise of describing experiences, taking into account the criteria of the relational pragmatics of association which stabilize and destabilize facts (Latour, 2016).

The attainment of consensus on the objectivity of facts through scientific practices has been criticized for excluding worlds and organizational forms that remain unseen by a vitiated modern epistemology. However, to carry forth this epistemic critique, it must be recognized the Latourian post-natural and post-social approach is not related to post-truth (Marras, 2020). In post-truth, according to Marras, "facts give way to factoids; the production of knowledge to the production of obscurities; scientific controversies are reduced to the most empty and petty sense of politics" (Marras, 2020: 41). Thus, for Actor-Network Theory (ANT) the post-social and post-natural do not entail the loss of realism (qua neorealism) nor of scientific objectivity (qua consensus among peers, with results open to critique and discussion).

3 "i) Remdesivir, used in the treatment of ebola; ii) Chloroquine, used in the treatment of malaria; iii) Ritonavir and Lopinavir, part of the cocktail used to treat HIV; iv) Interferon-beta, a molecule developed in treating bodily inflammation, and which, in earlier tests, had shown results in monkeys and macaques infected by MERS" (PebMed, 2020, s/p).

4 Chrloroquine and hydroxychloroquine are distinct drugs, both of which play a part in the controvery under study. Nonetheless, for the sake of economy, we have chosen to use only the term 'chloroquine' when we refer to positions in favour of "early treatment" in Brazil.

5 The Laboratório Químico Farmacêutico do Exército (Chemical Drug Laboratory of the Army), founded in 1908, is the oldest in Brazil (ALFOB, 2019).

6 Throughout the article, we use the expression "early treatment" in quotation marks since it is an object of public dispute surrounding the disease regarding which there is no consensus.

7 The vaccine known in Brazil as 'CoronaVac' is generally called the "Sinovac vaccine" or the Sinovac Biotech vaccine" in the English-language media and academic literature. As we are discussing Brazilian phenomena, we have opted to retain Brazilian usage throughout this article.

The idea of *performance*[8] proposed by Annemarie Mol (2002) means "to make exist, enact, make effective". When we speak of performativity and performing we are hence describing how practices, in a variety of ways, "make [something] take place", which helps us to think about the construction of facts. We are not, therefore, thinking through a reality that exists beyond practices, but, rather, that is embedded in practice, in the understanding that relational practices create realities. Practices leave traces – that is, materialities (documents, recipes, statistical data) that enable us to retrace preceding steps to thereby understand: (i) which actors were selected to delineate the construction of a fact; (ii) its effects on the creation of new realities. We argue that the public debate surrounding "early treatment" overlows its initial boundaries, generating realities that become materialized as the development of vaccination in Brazil gets underway.

We have sought out ways of approximating and observing situations in which reactions to the vaccine and its developments were in evidence. Our inspiration in ANT points to a path: from a starting point, we describe relations that develop from it through a descriptive practice that aims to explore the existence of mediators while the construction of reality unfolds (Latour, 2012).

Description is not restricted to action, usually associated with human activity, but is extended to processes of mediation between humans and nonhumans interrelated in networks of socio-technical relations (Latour, 1994). This is possible because ANT suggests that, by extending symmetry of action to the heterogenous relations between humans and nonhumans, we can amplify the scientific and political interpretations that ensue from co-constructed realities that are unstable and alterable (Latour 1994, 2000, 2012, 2016). It should be noted that we did not observe directly the processes and practices we describe, but rather accessed them though official rhetoric, documents, or statements by specific actors as reported in the media or in social networks.

We have chosen to describe relations through the lens of symmetry[9] because: (i) we avoid explanatory *a prioris* in the analysis of public debates; (ii) we have chosen to describe relations in such a way that the asymmetries between versions, involvement[10], and the mediators that promote them become visible; and (iii) we can map the tensions, frictions, and transformations that relations generate in the construction of realities.

Mapping begins on the 11th of June 2020, with the announcement of the partnership between the government of the state of São Paulo[11], the Butantan Institute[12], and the Chinese Sinovac Biotech Laboratory for the production of the CoronaVac vaccine in Brazil. Taking this factual signpost, we mapped critical comments that began to circulate in: (i) far-reaching news portals; (ii) Facebook pages and groups; (iii) documents produced by Brazilian medical institutions and organizations; (iv) social media profiles of actors considered to have played a key role in the controversy. The period we mapped extended from June 2020 to January 2021.

Facebook pages were chosen through web searches using the following key words: "anti-vaccine (antivax)"; "against the vaccine"; and "early treatment". Two pages emerged from these searches: "O lado obscuro das vacinas" ("The dark side of vaccines", created on the 8th of June 2017 with over three thousand likes) and "Movimento contra a vacina no Brasil" ("Antivax movement in Brazil", created on the 21st of August 2020, with over one thousand likes)[13]. Although the first page had a greater number of likes, it was less active during the period under consideration, with few publications referring to Covid-19 vaccines. A web search for "early treatment" took us to the Facebook group "Covid tratamento precoce – Médicos pela vida Campo Grande"

8 Mol also uses the term 'enactment' and 'enact' with the same meaning as 'performance'.

9 Symmetry is the epistemic proposal which expresses the heterogeneity of relations (Latour, 2012).

10 Involvement is the term used in ANT to express that relations do not occur outside of relations of convincing and power, and that they do not occur in a spontaneous manner (Latour, 2016).

11 Brazilian states adopted specific measures for social distancing, and, specifically in the case of São Paulo, for developing research on immunity. These acts were unsuccessfully challenged by the Bolsonaro government in the Supreme Court.

12 The Instituto Butantan (Butantan Institute), founded in 1901, is the largest producer of immunobiologicals in Brazil.

13 Although the page is called "Antivax movement in Brazil", and despite remaining active in terms of the number of posts and interactions during the period under analysis, it is the initiative of an individual, a member of the social network known as "The interventionist".

("Covid early treatment – Doctors for Life Campo Grande"), created on the 30th of June 2020 by a doctor from the city of Campo Grande, in the state of Mato Grosso do Sul. This group was highly active, with over four thousand members at the time of writing.

Finally, we also analysed the protracted meeting of the Board of the Associação Nacional de Vigilância Sanitária (ANVISA, National Association for Health Surveillance) which took place on the 17th of January 2021, and which authorized emergency use of the CoronaVac and AstraZeneca vacccines. We followed the meeting and took fieldnotes, registering the fact that the decision was made at a time of tension, since it would bring to a close some of the debates which were involved in the controversy.

Research techniques were inspired by the methods of 'virtual ethnography' (Mercado, 2012), which observes interactions mediated by tools of communication, online interviews, the analysis of digital documents, among other techniques that allow us to understand social relations unfolding in virtual space. In order to write this article, we analysed digital documents, observed the activities of the selected Facebook pages and groups (but did not participate in them), and kept fieldnotes. Taking official documents, videos and social media posts which were critical of the development of the CoronaVac vaccine and defended "early treatment", we analysed how these debates, which evoked "medical authority" and scientific backing from different angles, both reverberated in Facebook groups contrary to vaccination and fed back into them. When mapping was complete, we were able to identify how the groups involved in criticizing vaccination organized their practices, channelling the Brazilian reality towards accepting chloroquine as a "cure" for the pandemic.

The remainder of this article is divided into three parts. The first part tracks the emergence of the CoronaVac vaccine and of groups which were against it. We return to the start of the pandemic to understand 'early treatment' as a relevant actor in the controversy. The second part describes the reception of the vaccine through the Anvisa meeting that approved its emergency use. Finally, the third part returns to some of the points raised in the article and weaves reflections on the effects of the controversy on the fight against the pandemic in Brazil.

Reactions against vaccination during the Covid-19 pandemic in Brazil

Before we describe some of the contrary reactions against news of the development of the CoronaVac vaccine in Brazil in June of 2020, we present certain prior events that aide us in understanding the connections that would later be established and the arguments that would be engaged.

On the 7th of February 2020, Law 13.979/2020 was approved, laying out measures for tackling Covid-19 in Brazil. These included isolation, quarantine, social distancing, and the use of masks to avoid exposure to the virus by strategies of "horizontal contention" (CFM, 2020: 2). These policies were to reduce levels of contagion, and to thereby prevent the collapse of the healthcare system until such time as it would be able to adapt to the growing demand for hospital beds (Pereira, 2021). As Covid-19 became a global phenomenon, the pandemic produced landscapes that "compose new rhetoric and practices that intervene in the daily affairs of people and institutions" (Segata et al., 2021: 8). However, the scale of the pandemic does not transform it into a homogenous event; on the contrary, the pandemic is "a multiple and unequal event" (Segata et al., 2021: 8).

Among the difficulties in maintaining sanitary measures as barriers to the spread of the virus is a characteristic of the virus itself: its long period of incubation, which means that the disease can be transmitted by those who are still asymptomatic. There are also cases in which infected people remain asymptomatic during the full cycle of the virus, but transmit it nonetheless. These two characteristics of the virus, compounded by the difficulty in carrying out large-scale tests, resulted in heterogenous and disordered measures of isolation, social distancing, quarantine, and, in more extreme cases, lockdown, during different stages of the pandemic. These measures furthermore met with harsh criticism, being considered harmful both to the economy and to the popularity of president Jair Bolsonaro (Nascimento et al., 2020).

Alongside attempts at establishing isolation and social distancing strategies to combat the pandemic, the Ministério da Saúde (MS, Health Ministry) initially declared itself in favour of the use of chloroquine only in severe cases of the illness, on patients who were hospitalized and under medical care. The theme meanwhile assumed the contours of a political dispute between the president's will and the position of the MS, as we can see in the conflicting technical statements that follow.

In a statement released on the 23rd of March 2020[14] the Sociedade Brasileira de Infectologia (SBI, Brazilian Infectiology Society)[15] considered the use of chloroquine in treatmenting Covid-19 to be a "life-saving experimental therapy", which should only be used as a clinical trial approved by an ethics commission, such as Comissão Nacional de Ética em Pesquisa (CONEP, National Commission for Research Ethics), or by the ethics commission of the hospital in which the procedure is to be adopted. The statement furthermore established that treatment should be decided on a case-by-case basis, that it must be evaluated by the attending doctor, and that it was counter-indicated as a prophylactic or in non-critical cases.

However, on the 16th of April, the very day in which the Health Minister Henrique Mandetta was removed from office, the Conselho Federal de Medicina (CFM, National Medical Council), the agency responsible for regulating professional medical conduct, released technical report nº 4/2020 which considered that chloroquine could be used on patients who had just been diagnosed with infection, presenting mild symptoms, so long as it was approved by doctor and patient. The doctor had to explain to the patient that there were no studies that proved the efficacy of the drug in treating the disease. The report furthermore stated that doctors who used the drug during the pandemic would not be deemed to have committed an ethical infraction (CFM, 2020). On the 17th of April, Dr. Nelson Teich took over as Health Minister, but remained less than one month in office because of disagreements concerning the protocol that authorized use of chloroquine, the so-called "early treatment", which was defended by the president of the republic (Junqueira e Machida, 2020).

On the 20th of May 2020, in the presence of the new Health Minister, General Eduardo Pazuello, the MS approved the use of chloroquine in "early treatment" and suggested it be used in the Brazilian Sistema Único de Saúde (SUS, National Health Service)[16]. The protocol authorized and indicated the use of drugs in "early treatment" at the onset of Covid-19 symptoms. These drugs included chloroquine, as well as others such azithromycin and ivermectin[17]. It was the doctor's responsibility to inform the patient that there was no scientific evidence for the efficacy of the drugs before they made a joint decision, which would require that the patient sign a term of consent. The protocol also advised the population to seek medical or hospital care as soon as symptoms manifested themselves, and not only when or if they were aggravated.

On the 22nd of May 2020, the Conselho Nacional de Saúde (CNS, National Health Council), released Statement 042, recommending immediate suspension of the MS protocols for treating patients diagnosed with Covid-19. The statement claimed that use of chloroquine was a political, rather than technical decision, and that any treatment needed to be anchored in the criteria of health experts. The statement claimed that "the search for solutions for preventing and treating Covid-19, as well as the conclusions already published in scientific journals, such as The New England Journal of Medicine, JAMA, The BMJ 1 and the BMJ 2" (CNS, 2020), showed that these drugs had not delivered the expected results in combating Covid, but instead had produced adverse effects, such as cardiac problems. The technical statement also referred to medical organizations such as the

14 The statement also observes that Gautret et al.'s 2020 study "Hydroxychloroquine and azithromycin as a treatment of Covid-19: results of an open-label non-randomized clinical trial", which claimed to show some 'benefit' in the use of these drugs, is questionable because of the small sample analysed.

15 Created in 1980, the Brazilian Infectiology Society is a medical association that promotes the development of infectiology in the country, through scientific, technical, cultural, and social exchanges between its members.

16 The National Health Service (SUS), enshrined in the Brazilian Constitution of 1988, is one of the largest public health systems in the world providing full, universal and free healthcare. It is managed by the the levels of the federation: the Union, states, and municipalities.

17 The documents were removed from the internet after the Health Minister Marcelo Queiroga claimed, under oath, in the Covid-19 Parliamentary Enquiry Commission that there was never a protocol for "early treatment" of the disease (Junqueira, 2021).

Brazilian Infectiology Society, the Sociedade Brasileira de Pneumologia e Tisiologia (SBPT, Brazilian Society for Pneumology and Phthisiology) and the Associação de Medicina Intensiva Brasileira (AMIB, Brazilian Association for Intensive Medicine), learned societies which were against the use of chloroquine and hydroxychloroquine as treatments at any stage of Covid-19 (CNS, 2020).

This brief chronology of the position of government agencies and medical organizations in the first months of the pandemic in Brazil reveals how the government's defence of protocols for "early treatment" was gradually being strengthened by the controversial support of entities such as the CFM. The 11th of June 2020 emerges as a prime candidate for a kick-off date for reactions against vaccination in the context of the Covid-19 pandemic in Brazil. This was the day the government of the state of São Paulo announced a partnership between the Butantan Institute and the Chinese Sinovac Biotech Laboratory for phase 3 of randomised trials of the CornaVac vaccine to take place in Brazil. According to the terms of the agreement, once the *efficacy* and *safety* of the vaccine were assured, the Institue would have the technical know-how for large-scale production of the vaccine for use in the country.

Soon after this agreement was announced, supporters and representatives of the government of Jair Bolsonaro attacked the partnership, stressing the "Chinese origin" of the vaccine as a reason for doubting its efficacy and safety (Eller, 2020). The main theory that began to circulate in social media was that of a Chinese political conspiracy that: (i) *produced the virus* and (ii) *made a vaccine available*. Two days after the partnership between the Butantan and Sinovac was announced, the hashtag "Chinese vaccine" became one of the most discussed Twitter topics in Brazil.

The first challenge to the announcement of the partnership were not an openly declared "antivax" movement, but reactions against the "Chinese vaccine". Triggered by representatives and supporters of the federal government, the reactions came to perform CoronaVac as a political artifact associated with a Chinese/Communist virus. At the same time that a bi-partitioning of science and politics was stressed – underscoring the purported neutrality of the former – the acceptance or refusal of a scientific artifact was associated with a xenophobic politics. Meanwhile, alongside efforts at weakening the network established around the CoronaVac vaccine, a second movement becomes constituted, targeting the defence of the network of drugs that came to be associated with "a cure for the virus" – which came to be known as the "early treatment for Covid-19" – generated mistrust of vaccines in general.

In the remainder of this article, we will describe each of these constitutive elements of the controversy, starting from statements that "the Chinese vaccine is not scientific" and "early treatment does not need scientific evidence". We map the shifts in premises and the scientific arguments mobilized and/or challenged by the actors of the movements in question.

"The Chinese vaccine is not scientific"

On the 27th of June 2020, the Health Ministry announced an agreement to produce the "Oxford vaccine", in partnership with the AstraZeneca lab. The Brazilian institute charged with developing the technology for producing the vaccine was the Fundação Oswaldo Cruz (Fiocruz, Oswaldo Cruz Foundation). The agreement included the transfer of technology and the start of vaccine production in Brazil as early as December. The announcement of this deal with the federal government led to the construction of a sharp polarization between the "Chinese vaccine" and the "Oxford vaccine", which aligned itself with the polarization between João Doria, governor of the state of São Paulo, affiliated with the Partido Social Democrata Brasileiro (PSDB, Brazilian Social Democratic Party), and the government of Jair Bolsonaro (who has been unaffiliated since 2019). In the midst

of this polarization, Jair Bolsonaro stated, in a 'live' intended for his supporters and transmitted on the 30th of July, that: "We got into that consortium from Oxford. Everything suggests that it's going to work out and 100 million units will arrive for us. It's not from that other country, OK people? It's from Oxford" (Carvalho, 2020).

The defence of a "reliable science" produced in England, in contradistinction to an unreliable science produced in China, was more than mere rhetoric which only had a passing effect on the sociotechnical network of vaccination in Brazil. Indeed, the opposition set up by Jair Bolsonaro and his supporters had important effects on the Brazilian population, which either engaged with or rejected vaccination against Covid-19. In the Facebook page 'Antivax Movement in Brazil' we see associations between the CoronaVac vaccine and a "New World Order" which would subsume the people of the world to Chinese communism. Similarly, many advocated for the non-obligatoriness of vaccination in defence of individual freedoms[18].

Doubt-mongering, exploiting the uncertainty that is intrinsic to the production of scientific knowledge, is not a new strategy. Authors such as David Michaels (2005) and Naomi Oreskes (2015) describe how large industries from different sectors have long used similar strategies to question scientific consensus, raising doubts concerning the harmful effects of their practices. The authors argue that there is a clear pattern to these industrial strategies, including tactics such as drafting in specialists to produce "alternative facts", which suggests that such strategies are wilful and organized rather than irrational or based on ignorance. As Oreskes (2015: 2) stresses, what we see is the key role of uncertainty, "insofar as the centrepiece of the doubt-mongering strategy is to insist that the relevant science is too uncertain to provide a good basis for decision-making".

In the case under analysis, the same phenomenon can be seen in challenges to the efficiency of CoronaVac, and, later, in the rejection of a mass vaccination campaign in Brazil. These challenges are justified by an ideological base, which is also made viable by exploiting uncertainty to construct political claims (Oreskes, 2015). References to the "Chinese virus" and to a "New World Order" thus sow doubt regarding robust scientific knowledge, and produces affectations of daily life which are not restricted to "scientific answers".

In this sense, the statement originally meant to fight the production of the CoronaVac vaccine by the São Paulo government, unfolds into three other positions: the first in support for the production of the "Oxford vaccine"; the second against a compulsory vaccination policy; the third in favour of "early treatment" instead of vaccine production. These developments are synthesized by Jair Bolsonaro on the 26th of October 2020, after a Supreme Court Justice raised the possibility of legal action regarding the matter of compulsory vaccination. In a meeting with supporters at the presidential palace he claimed: "As I see it this is not a matter for justice, it's a matter of health above all. A judge can't decide if you're going to get vaccinated or not, that doesn't exist". In the same meeting, Bolsonaro brought up the issue of a "cure" in support of his "early treatment" policy. In his words:

> Isn't it cheaper or easier to invest in a cure than in the vaccine? Or try for both, but to not forget the cure? [...] The cure, me, for example, I am living proof. I took hydroxychloroquine, others took ivermectin, other took Annita, and it worked. Everything suggests that everyone who treated early with one of these three options was cured (Mazui, 2020, available at: https://g1.globo.com/politica/noticia/2020/10/26/nao-pode-um-juiz-decidir-se-voce-vai-ou-nao-tomar-vacina-diz-bolsonaro.ghtml).

18 Similar associations feature in Brazilian conservative and right-wing news shows. One example is "Os Pingos nos Ís" (Dotting the I's), on the Jovem Pan station, which, systematically throughout 2020, produced programmes on the "Chinese origin of the pandemic", the "unsafety of vaccines", and the purported inefficiency of lockdown and social distancing strategies. The programme regularly invited doctors who defended "early treatment". The programme is available in the eponymous YouTube channel (Jovem Pan, 2020).

As we will see, the network established around "early treatment" received backing from an important part of the Brazilian medical community, more so than policies targeting the production of vaccines. By engaging specialists in support of "early treatment", a debate which had been superseded by the international community is revived, producing a web that sustains the federal government's policies.

Reactions against the vaccine can also be seen in the results of two polls carried out by the Datafolha Institute between August and December of 2020[19]. In the first poll, published in the 15th of August, 9% of those interviewed claimed that they would not take a vaccine to deter the pandemic, and 3% could not offer an opinion on the matter. On the 14th of December 2020 the percentage of people who claimed that they would not get vaccinated rose to 22%, and those who could not provide an opinion to 5%. In the December poll, those who claimed that they would accept being vaccinated were asked about the origin of the vaccine. According to the pollsters, "an approved vaccine that had been developed in China would be rejected by 50% of adult Brazilians", while "the majority would accept vaccines developed by Russia (60%), the United States (74%) and the United Kingdom (70%)" (Datafolha 2020: 4). The December poll furthermore registered that, although the majority (56%) of interviewees claimed to be in favour of compulsory vaccination for the whole population, among those who declared that they always trusted the claims of President Jair Bolsonaro this figure fell to 39%.

We can thus see that the polarization, which originally pitted the "Chinese vaccine" and the "Oxford vaccine", associating the CoronaVac vaccine to a supposed "Communist threat", reverberated in these polls. Furthermore, the idea that "the Chinese vaccine is not scientific" developed, first, into support for the Oxford/AstraZeneca vaccine and ensuing political polarization, and, later, into a generalized mistrust of the safety and efficacy of the vaccines against Covid-19, generating, in the end, a weakening of the mass vaccination campaign in Brazil. For a parcel of society, vaccination came to be associated with a policy of curtailing individual freedoms. As we will see shortly, it is precisely the idea of individual freedoms that proponents of "early treatment" uphold, claiming that, unlike vaccination, such treatments do not require scientific evidence to be adopted wholesale.

"Early treatment does not need scientific evidence"

Along with the early deals for vaccine production between Brazilian institutions and international laboratories, president Jair Bolsonaro pushed for the adoption of "early treatment" protocols. Treatment was a central element in official discourse, emerging as a means to halt the spread of the disease. However, treatment was hardly consensual among medical institutions. The new protocols for 'early treatment' were not endorsed by the Brazilian Infectiology Society (SBI), which assumed a public position against it, including releasing statements to the population at large. Statement nº 15, issued on the 30th of June 2020, for example, refers to the Medical Code of Ethics and the resolutions of the Federal Council of Medicine:

> We are living through a serious public health crisis. We cannot put the health of the Brazilian population at risk through *guidelines with no scientific evidence*. The use of any substance for purposes other than those it has been approved (off-label) must be an individual decision of the doctor, on a case-by-case basis, and making the possible benefits and risks known to the patient, although publicizing this conduct is forbidden. According to the Federal Council of Medicine, in the Medical Code of Ethics, CFM Resolution nº 2.217, issued on the 27th of September 2018, modified by CFM Resolutions nº 2.222/2019 and 2.226/2019, Chapter 13, concerning MEDICAL PUBLICITY: "The doctor is forbidden: Art. 113. To promulgate, outside of the scientific community, treatment processes or discoveries the

19 The polls were undertaken by phone calls, spanning representative samples of the adult population of Brazil. In the August poll, 2065 people were interviewed; 2016 people were interviewed in December. The statistical margin of error was calculated at 2%.

value of which has not been explicitly scientifically recognized by competent agencies" (Sociedade Brasileira de Infectologia, 2020: 4, *emphasis added*, available at: https://infectologia.org.br/wp-content/uploads/2020/07/nota-6-esclarecimento-hidroxicloroquina-Covid-19.pdf).

A further statement from the SBI, issued on the 17th of July 2020, analysed randomized trials with control groups. One study evaluated Covid-19 patients in 40 US states and 3 Canadian provinces; another, carried out in Spain, evaluated virological (reduction of the viral load in the nasopharynges) and clinical (reduction of symptom duration and hospital stays) efficacy. In none of these studies were any virological or clinical benefits observed in patients that took chloroquine when compared to those who received no pharmacological treatment (the placebo group). The statement warns that the Health Ministry, states, and municipalities should not use public funds to invest in these drugs:

"With this scientific evidence, the SBI abides by the orientations of all medical scientific societies in developed countries, as well as of the World Health Organization (WHO), that hydroxychloroquine should be discarded in any phase of the treatment of Covid-19" (SBI, 2020a, available at: https://infectologia.org.br/wp-content/uploads/2020/07/nota-6-esclarecimento-hidroxicloroquina-Covid-19.pdf).

In the wake of a movement that contested and denied the scientific legitimacy of the drugs used in "early treatment", we also find the statements of the Agência Nacional de Vigilância Sanitária (Anvisa, National Agency for Health Surveillance), Fiocruz and the Butantan Institute, among others. Nonetheless, president Bolsonaro's remarks on 'early treatment' reverberated and fed back into the position of medical entities and groups that started to become articulated throughout the country.

In what concerns medical entities, we must highlight the positions of the Associação Médica Brasileira (AMB, Brazilian Medical Association), the Conselho Federal de Medicina (CFM, Federal Council of Medicine) and the Sociedade Brasileira de Cardiologia (SBC, Brazilian Cardiological Society), which, during 2020, either remained neutral or declared themselves to be in favour of the right of doctors to choose treatment for Covid-19 patients. The main document adduced to sustain this position is the Helsinki Declaration, which concerns the ethical principles for medical research on human beings and was adopted by the 18th General Assembly of the World Medical Association, held in 1964 in Helsinki, Finland. Paragraph 37 of the declaration states that:

In the treatment of an individual patient, where proven interventions do not exist or other known interventions have been ineffective, the physician, after seeking expert advice, with informed consent from the patient or a legally authorised representative, may use an unproven intervention if in the physician's judgement it offers hope of saving life, re-establishing health or alleviating suffering. (General Assembly of the World Medical Association, 1964, available at: https://www.fcm.unicamp.br/fcm/sites/default/files/declaracao_de_helsinque.pdf).

It is in this sense that the Helsinki Declaration, which authorizes doctors who obtain patient consent to make use of drugs that are not scientifically proven to work, becomes a relevant actant in the network established around the defence of "early treatment" during the Covid-19 pandemic in Brazil. It is in light of this mobilization that the SBI assumes a position against the use of these drugs (as seen in the previous quotation), while, at the same time, entities such as the AMB will make an extensive plea for medical autonomy. Claiming to be a signatory of the Declaration, the AMB published a statement on the 19th of July 2020, titled "Hydroxychloroquine: AMB defends medical autonomy", which ends with the following observation:

We cannot allow ideologies and vanities, dazzled by the spotlight, to suddenly make us regress in practices that have long been respected. One cannot cry out for science and assume positions based on ideology or partisanship, ignoring practices that are consolidated in medicine. This is a crime against medicine, against patients, and,

above all, against science itself (Associação Médica Brasileira, 2020, available at: https://coronavirus.amb.org.br/hidroxicloroquina-amb-defende-autonomia-do-medico/).

For the AMB, prohibiting doctors from using unproven prophylactic, diagnostic, and therapeutic measures on their patients would thus be a partisan/ideological act, which would be harmful to science itself. By labelling those who disagree with them "partisan", the AMB, far from creating neutrality, reaffirms the intentions of actors to assume central roles in a dispute that, in this case, refer back to critiques of the federal government's adoption of "early treatment" protocols. The arguments engaged reveal attempts to isolate "science" from research and peer-review practices, associating it with a clinical, *empirical knowledge* that, in the final analysis, must be operated and validated on an individual basis.

The fact that important actors from the Brazilian medical community defended treatment which, as we saw earlier, had been discredited by the international scientific community, cannot be neglected. Crucially, although representatives and supporters of Jair Bolsonaro's government sought to resurrect a controversy that had largely been overcome by the international scientific community, a simplistic opposition of the sort "Bolsonaro *versus* specialists" does not account for the multiplicity of the network. Not only were there solid alliances between the groups mentioned above, but the defence of "early treatment" became integral to the practices of different actors linked to the Brazilian medical community.

Examples of these alliances and associations can be found in the Facebook group "Covid early treatment – Doctors for Life Campo Grande". The group was created on the 30th of June 2020 by a cardiologist. With over 4000 members at the time of writing, the group actively shared videos, texts, and images touting the supposed benefits of the use of the drugs advocated by the Bolsonaro government. The group furthermore reached beyond Facebook, as can be seen in a publication dated 1st of July 2020, in which a group of doctors, among them the founder of the group, are pictured with the mayor of Campo Grande[20] in a meeting to approve "early treatment" protocols. In the caption we learn that a WhatsApp group of over 200 doctors formed spontaneously in the space of two days.

For the period in which we mapped publications in the Facebook group – June 2020 to January 2021 – we observed that the Helsinki Declaration, as well as the statements of the aforementioned entities, were widely disseminated with the aim of giving *scientific credibility* to the medical practices advocated. Texts and videos produced by the Health Ministry were shared with the same aim, advising healthcare workers to adopt the treatment protocols; statements by regional councils favourable to the adoption of "early treatment" were reposted, including the Regional Medical Councils of Mato Grosso do Sul and Santa Catarina, and reviews by the Federal Medicine Council stating that the use of drugs such as chloroquine would not amount to an ethical infraction by professionals treating Covid-19 patients.

Along with the construction of scientific credibility, an association was established between "early treatment" and the "struggle against social inequalities". The claim made here was that, while doctors were already protected from the virus through drugs such as chloroquine, the population at-large would have to treat themselves with dipyrone or paracetamol. In these situations, drugs are performed as *political actors* in entrenched debates, conveying not only the greater or lesser efficacy of a treatment but also the existence of social markers (such as "doctors" *versus* "the populace") which would, in the end, determine who was saved and who would die *by* the technoscientific network established around the non-validation of a "cure" for Covid-19.

A further point worth highlighting in the messages that come to compose the network of "early treatment" is how the challenge to a specific premiss of scientific practice, to wit, the *validation of scientific knowledge through the peer-review process*, becomes inscribed in the acts of the actors of the medical community.

20 Campo Grande is the capital of the state of Mato Grosso do Sul, part of Brazil's Central-West Region.

A detailed construction of this movement can be seen in a post by a doctor based in the Federal District on the 18th of July 2020, in the group that we have been following. Addressing her fellow doctors, she claims:

> "(...) Remember that *scientific consensuses should play a minimal role in medical practice*, serving only as guidelines and not as absolute orders that colleagues must follow or else be penalized by sanctions or harsh criticism by their reviewers (almost always chosen by political criteria within the field). It is not a 'society' that defines what is best for a patient, it is an individual doctor, A PERSON or A GROUP OF PEOPLE who is, or are [sic], charged with the case [...] It is dangerous when advocates of the (wonderful, to be sure) 'medicine based on evidence' do not take into account their own limitations, and that, in the final analysis, *'absence of evidence' is not 'evidence of absence'*. Even worse is when the societies and agencies of the field think that they is [sic] more important that they really is [sic] in handling individual cases. It is the doctor, the patient, and medicine. These are the actors. Full stop." (Doctor based in the Federal District, *emphases added*).

As Oreskes (2015) makes clear, challenging the existence of a scientific consensus, accentuating dissidence, pinpointing and encouraging individuals who diverge from the consensus, or even fabricating new divergences, is a recurring strategy for sowing doubt in the minds of the public at-large. A movement of specialists, associated with political actors situated "outside" science, thereby gains momentum, seeking to destabilize a scientific consensus even if that means adopting a strategy that denies the very legitimacy of the production of consensus in science.

It is interesting to note how scientific consensus is disqualified, while the construction of a medical individuality is strengthened. An *evidence-based medicine* is performed as a medicine that, rather than ensuring the scientific merit of medical practices, inhibits individual autonomy by way of "political criteria". Thus agencies in the field, and medical societies, are construed as lacking the legitimacy to interfere in decisions, since it is the individual doctor, and not the medical community, who can provide the "best appraisal" of a given case.

The strategy of denying the requirement of consensus, or even of weakening the premiss through which scientific knowledge is validated by peer review, tellingly unravels when the same actors who claim that there is "no need for scientific evidence" rush to assert that "there already is scientific evidence". This strategy is found with greater frequency after October 2020, when international scientific publications – such as Ladapo et al. (2020), become disseminated through social networks, showing research results that prove the efficacy of chloroquine in reducing death rates. However, these studies were invariably *preprints* – that is, research reports published in online repositories that had not yet undergone peer review.

Finally, the same actors who were on a quest for "scientific evidence" for 'early treatment', raise doubts about the scientific evidence for the efficacy of vaccines. These were in an advanced stage of production by the end of 2020. It is noteworthy that the very same arguments the challenge "early treatment" are not engaged in challenges to vaccination. One example is Facebook post on the 10th of November 2020. Remarking on news that a trial volunteer for the CoronaVac vaccine had committed suicide, a doctor argued that further research needed to be carried out, since "suicide can be an adverse effect of any medication". Furthermore, he noted that:

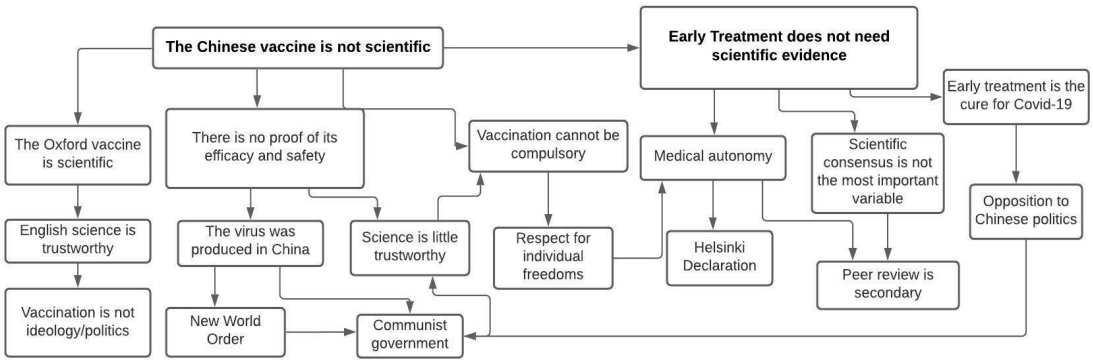
> The clarity of the data and scientific honesty beyond the publication of the research in specialized medical journals where it is subject to harsh critique from peers, is part and parcel of the incorporation of new drugs and new medical technologies!! This is why I counter-indicate vaccination against COVID to my patients, with any of the vaccines in the current circumstances (Doctor from Campo Grande, 2020).

As we noted above, the hostility constructed by Jair Bolsonaro and his followers toward vaccine production had considerable effects on the Brazilian population's engagement with vaccination against Covid-19. The same can be said of the alliances established between government policies and a *part of* the Brazilian medical

community that performed a set of drugs as *cures for the pandemic*, all the while generating mistrust in the efficacy and safety of vaccines and criticizing social distancing and lockdowns as strategies that "lacked scientific evidence".

As we will now show, Anvisa's approval of the CoronaVac and AstraZeneca vaccines for emergency use on the 17th of January 2021, became an important event for securing vaccines as scientific artifacts, weaking the contrary reaction that we have thus far described and which we synthesize in the diagram below. Nonetheless, the controversy continued to produce important effects on the pandemic in Brazil.

Figure 1: Synthesis of the statements mapped in reactions against Covid-19 vaccination in Brazil



Approval of the CoronaVac vaccine for emergency use by the Agência Nacional de Vigilância Sanitária (Anvisa, National Agency for Health Surveillance)

On the 17th of January 2021, Anvisa held a meeting of its Directory Committee to analyse the authorization for emergency use, in an experimental capacity, of the CoronaVac and AstraZeneca vaccines developed in Brazil by, respectively, the Butantan Institute and Oswaldo Cruz Foundation. At the moment the pandemic had reached alarming figures in Brazil: 209,000 dead and more than 8 million recorded cases (R7 2021). In this context of severe sanitary crisis, there were high expectations for the start of vaccination against the coronavirus.

When phase 3 testing for the CoronaVac had been concluded[21], controversies surrounding the efficacy and safety of the "Chinese vaccine" mellowed.[22] Nonetheless, the politicization of the debate pitting "early treatment" *versus* vaccine development continued to reverberate. There was thus apprehension surrounding the possible outcome of the meeting of Anivsa's Directory Committee. Uncertainty was compounded by the fact that, a few days before the meeting, the Butantan Institute had reviewed CoronaVac's general rate of efficacy.

On the 7th of January 2021, the Butantan Institute announced an efficacy rate of 78% for the vaccine; however, four days later – on the eve of Anvisa's analysis of the vaccine – the efficacy rate was rectified to 50,38% after tests with all people involved in all phases of the trials was considered. This review was preceded by challenges, raised by scientists and health professionals, against the Butantan Institute's standards for evaluating efficacy. The Institute, in turn, alleged that the data initially released referred to "a specific group of patients during one of the stages of the study, which had concerned prevention of mild cases of Covid-19 and not all cases" (Barifouse, 2021). The data thus initially released were merely "secondary".

21 Phase 3 is when clinical trials of the vaccines are carried out. For a vaccine to be authorized by Anvisa, it must prove to be at least 50% efficient.

22 The CoronaVac vaccine had already been approved for registry in three countries: The People's Republic of China, Indonesia and Turkey.

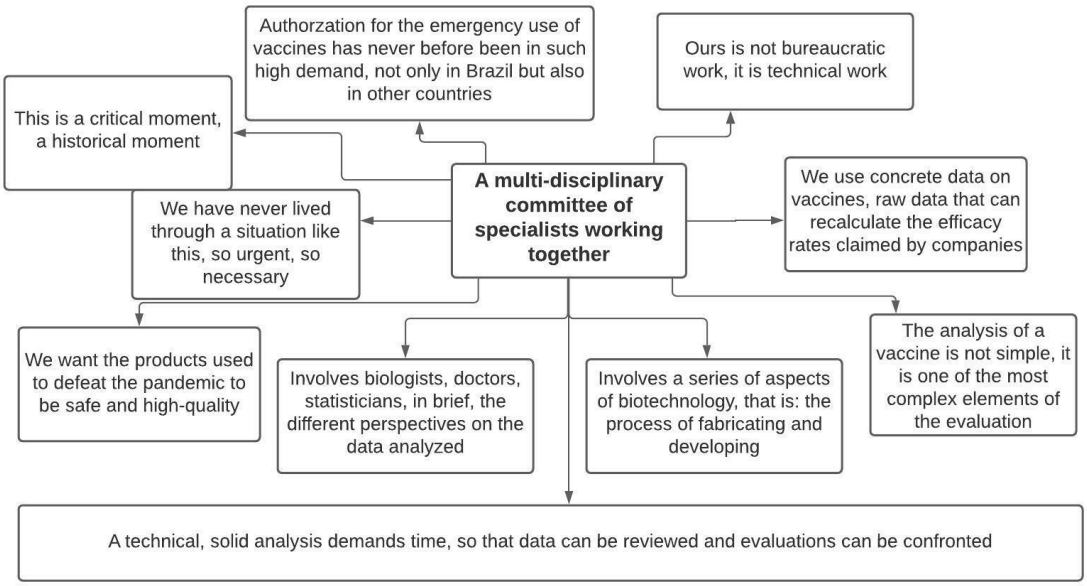
In its defence, the government of São Paulo also declared that the global efficacy rate of the CoronaVac vaccine had yet to be released. That is: data corresponding to "the results that include all people who got ill regardless of the severity of the illness" (BBC, 2021). The main argument raised by the government of São Paulo and the Butantan Institute was that the vaccine offered 100% protection against deaths and severe cases, having prevented hospital admittance of trial volunteers who had been vaccinated. At the time, Governor João Doria was the main spokesperson for the data issued by the Butantan Institute: "[...] these results mean that the Butantan Institute's vaccine has a high degree of efficiency and efficacy to protect the lives of Brazilians against Covid-19" (Cruz, 2021).

As studies of the CornaVac vaccine developed and testing progressed, a struggle was waged, for a few weeks, over who would administer the vaccine produced by the Butantan Institute, whether it fell to the government of São Paulo state or to the Health Ministry. However, before Anvisa's meeting it had already been decided that all vaccines, whether produced in the country or imported, would follow the National Immunization Plan (Plano Nacional de Imunização (PNI)). It was thus the federal government which would be responsible for distributing the vaccines to municipalities. Following the then-Health minister Eduardo Pazuello's declaration that vaccination would start on "D-Day and H-Hour" (Teófilo and Cardim, 2021), the executive coordinator of the Coronavirus Contingency Centre in São Paulo, João Gabbardo, admitted that the vaccines produced by the Butantan Institute would go to the PNI, with the caveat that "if the government's answer is that we should start after the 25th of January, we will not be following that guideline. The state of São Paulo will start vaccinating on the 25th" (G1, RS 2021). We will see, however, that vaccination started in the state of São Paulo before that date, right after the meeting of the Anvisa's Directory Committee.

The Anvisa Meeting

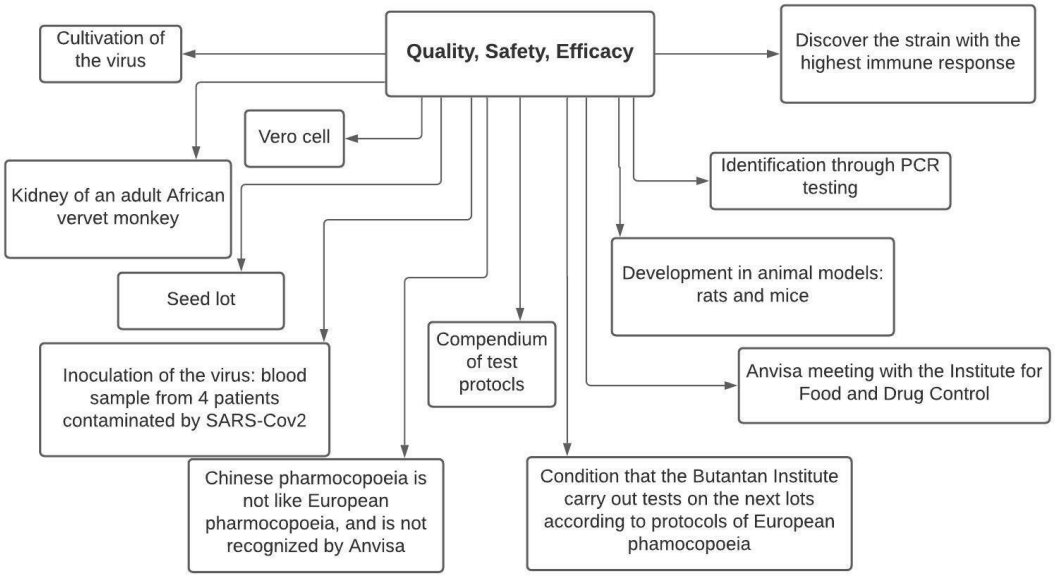
On the 17th of January 2021, after a meeting that lasted over five hours, Anvisa approved the emergency use of 6 million doses of the CoronaVac vaccine and 2 million doses of the AstraZeneca vaccine. The debate preceding the approval of the "Chinese vaccine" was particularly meticulous and protracted. The General Manager of Drugs and Biological Products, Gustavo Mendes Lima Santos, spoke first. He began by stating that it was "an honour to represent all the civil servants of the agency" (Anvisa, 2021a). Considering the politicized context in which debates surrounding the vaccine were taking place, reference to "career servants" and to the existence of a "multidisciplinary committee of specialists working together" served as markers of techno-scientific distinction. A range of arguments that sought to underscore the specialization and domain of science were advanced by the manager. This can be observed in excerpts from his presentation at the Anvisa meeting, transcribed below.

Figure 2- Synthesis of the arguments on the techno-scientific specialization of science in the development of a vaccine



This concern with distinguishing technical work from evaluations of a different nature was intended to underscore that the analysis in favour of the emergency use of the CoronaVac vaccine was carried out by multi-disciplinary specialists according to objective criteria. In this sense, 'safety' and 'quality' were evoked as principles that had to be rigorously followed. It should be noted that time was considered an essential element in ensuring scientific parameters; that is, time was needed to challenge, test and re-test the data. However, these specialized evaluations were referred to the singular historical context in which they were situated. No one pretended to sustain a technical evaluation that did not take into account the emergency and urgency of situations that demand scientific solutions. Nonetheless, a number of procedures, repertoires and terms proper to science and technical work were used, and these could only be contested from within that very field – which we make explicit in the figure below.

Figure 3 – Connections between different actors and networks actualized by Anvisa's General Manager of Drugs and Biological Products



The extracts in the Figure above indicate the existence of a wide network of actors, artifacts, and nonhumans involved in the process of fabricating, testing and approving the use of a vaccine. All elements are interlinked in the sociotechnical network via a number of associations. An example of the role played by nonhumans is the "normal kidney of an adult African vervet monkey" (Anvisa, 2021a). It is from this kidney that a vero cell is produced. Without this monkey the inoculation of the virus would be impossible as would the "discovery" of the strain with the highest immune response", as argued by the Anvisa servant.

On this issue, in what concerns tracking the connections between the different actors that compose the networks, we resume Latour's approach to the analytical exercise of mapping the sociotechnical networks involved in the controversies that are in evidence. As he notes, "to trace a network is thus always to reconstitute by a TRIAL" (Latour, 2019: 46-47), through the description and listing "of the other beings through which it is necessary to pass so that this situation can endure, can be prolonged, maintained, or extended" (Latour, 2019: 46-47). For ANT, the agency of actors is always thought of in relation, or, better still, in the relations exercised by actors within sociotechnical networks". Hence it is not an approach that focuses on the agency of humans, nonhumans, or artifacts "themselves", nor is it a matter of seeking out "intentionality" (Toniol 2021). Rather, its focus lies in the description of the associations and mediations exercised by different actors that coexist within sociotechnical networks.

In the general manager's presentation, the recourse to pharmacopoeia, which is the compendium of protocols for testing a drug, illustrates the numerous associations exercised by the different artifacts involved in the sociotechnical networks of vaccine production. Anvisa advocates that the fulfilment of its demands depends on the approval of drugs. In what concerns the CoronaVac vaccine, the fact that it was developed in accordance with Chinese pharmacopoeia, which is considered to be "more recent and unaligned with European [pharmacopoeia]" (Anvisa, 2021a)[23], led to the suspension of some of the procedures adopted by the Butantan Institute relating to immunogenicity tests[24]. According to Anvisa (2021a), these results were not presented during the study, since the only test presented was considered inadequate for a conclusive analysis. This fact, however, did not prevent emergency approval of the vaccine, but it did make continued approval conditional on the next lots produced in Brazil following European pharmacopoeia.

After the presentations and the endorsement of the technical areas, Meiruze Freitas, the director of Anvisa, the chair of the process of vaccine approval, voted in favour of the emergency use of the CoronaVac and AstraZeneca vaccines. However, she observed that there were "critical issues" surrounding the CoronaVac vaccine and therefore conditioned approval on the Butantan Institute signing an agreement to report on data concerning the immunological response of that vaccine[25]. This is how she justified her requirements:

> "[..] the known benefits of vaccines outweigh their risks. But we need continuous monitoring of adverse effects. A vaccine is only efficient if people are willing to take it. A vaccine against Covid-19 will aid in individual and collective protection" (Anvisa, 2021b).

However, even after the start of vaccination in Brazil, so-called "early treatment" continued to be proposed as a solution for the pandemic and the flexibilization of social distancing. In the first trimester of 2021, at least 8 people died in Brazil after being treated with inhalations of chloroquine. Four cases were notified in the state of Rio Grande do Sul, and four in Amazonas (Rocha, 2021). The procedures were publicly backed by president Jair Bolsonaro. It can thus be considered that the positive decision concerning the emergency use of the CoronaVac vaccine helped consolidate vaccination as a means to face the pandemic, but that it was unable to bring the controversy to a close.

23 Anvisa follows European pharmacopoeia.

24 Immunogenicity is a vaccine's capacity to induce the immune system to produce antibodies.

25 The Butantan Institute handed Anvisa the immunogenicity studies on the 30th of April 2021 (Albuquerque, 2021).

Concluding remarks

When the mapping of the controversy was concluded, we were able to identify how reactions to the vaccine delimit a group that buttressed the antivax movement, initially challenging the efficacy and safety of the CoronaVac vaccine, and later advocating for the adoption of "early treatment" as the main strategy for fighting the pandemic in Brazil. The performance of the statement "early treatment does not need scientific evidence" is part of this, building on the federal government's decision to push for chloroquine as a "cure" for the pandemic.

This direction can be interpreted as the performance of a *factoid* (Marras, 2020), which, instead of aiming for consensus anchored in the objectivity of facts, gives weight to a movement that allows actors to choose what is more convenient (Marras, 2020). The early use of drugs is adopted: (i) without the backing of Brazilian or foreign science, nor that of global organizations such as the WHO; (ii) channels the decision to use certain drugs to the the doctor and to patient consent; (iii) exempts doctors who use these drugs from having to justify themselves before their peers, in ethical councils; (iv) operates a network of regulations which dodge controversies based on political decisions, using artifices which invert the criteria of science.

Doctors who engage science to try and justify "early treatment" do so on the basis of the individuality of treatment choice, which is ultimately the decision of each doctor. We can see how the argument for the autonomy of medical choice is replicated in groups that support the efficacy of this treatment. Doctors use this justification to continue with "early treatment" based on medical *expertise*, sustaining the treatment through non-peer-reviewed empirical data. We can also see, however, an attempt to transgress a certain "hierarchy" of the scientific field itself, attempting to perform "early treatment" a fact.

The phenomenon of epistemic individualization was described by Zonnen as an "*I-pistemology*", an epistemology of the I, a return to "seeing is believing" as an effect of the loss of trust in the production of reality through a scientific lens. Cesarino (2021) analyses that this epistemic reorganization is promoted by digital infrastructure and the incorporation of a (failed) neoliberal effort to remove mediators (such as regulatory mechanisms, scientific procedures, controlled tests) in order to allow relations to flow more quickly (Cesarino, 2021).

Faced with this, Bruno Latour's (2014) claim that we live in a war between ontologically distinct worlds is bolstered. How, after all, are we to deal with alliances that sustain the inexistence of a pandemic? Or which resolutely uphold drugs that are contested by the international scientific community, while living in a country that, until May 2021, had seen over 430,000 deaths by Covid-19 and witnessed an unprecedented collapse of its healthcare system? How are we to promote deals, coalitions? How are we, in the end, to coexist? Without pretending to provide answers to the great philosophical and scientific questions of our times, we feel that we can point towards certain clues that will allow new lines of research to be envisaged, starting, specifically, from a pragmaticist relational perspective on science.

As Naomi Oreskes (2015) stressed, John Dewey had already observed that there are many answers to uncertainty, so that eliminating it is bound to fail. Attempts by scientists to create social consensus by redoubling efforts at making their technical claims less uncertain does not, therefore, seem to be the best option. The univocal view that opposition to a "scientific fact" is tantamount to a "*lack of information*", rather than suppressing demands, closing debates or filling in gaps, actually in most cases perpetuates chasms since attempts at silencing the other through accusations of disinformation raises a number of problems. This is all the more evident when we consider the alliances between the federal government of Brazil and the country's doctors in favour of "early treatment" of Covid-19, as described in this article.

Instead of trying to eliminate uncertainties, we should perhaps strive for the criterion of a *pragmatic truth* (Almeida, 2021) by means of which upholding a fact occurs through the description of the conditions the enable its verification. Pragmatic truth should be activated as a way of acting between worlds, between

ontologies which are, and will remain, distinct. The challenge is hence to think of ways of amplifying other social correlations, ways of life, in the production of knowledge, withholding collective criteria such as peer review and the production of scientific consensuses.

This issue, which we are unable to develop here, follows the work of Nascimento, Cesarino and Fonseca (2020), and their reflections on i-pistemological choices. How can we hold the doctor's actions to account when the doctor is exempt from defending his choice to use "early treatment" before an ethics committee? The production of pragmatic truth is invariably the production in the order of multiplicity. Realizing it is hence to oppose a staunch defence of the primacy of "individual choices" over experiences that are profoundly collective.

As we are concluding this article (May 2021), a parliamentary hearing commission (Commisão Parlamentar de Inquérito, CPI) has been instated, the Covid-19 CPI, also called the Pandemic CPI or the Coronavirus CPI. The instatement of the CPI involved a range of congressmen, and was determined by the Supreme Court (STF, 2021). The aim of the CPI is to incestigate purported omissions and irregularities in government spending during the Covid-19 pandemic. The testimonies have already brought to light a number of debates, including those concerning "early treatment" as an aim of government policies, the refusal to purchase vaccines in 2020, and the endemic delay in the vaccination schedule in 2021. Even with the vaccination of the Brazilian population, "early treatment" continues to be disputed as a solution to the pandemic, and is thus performed, in myriad ways.

Received: May 31, 2021
Approved: October 2, 2021

Translated by Luiz Costa

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