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# “THOSE ON THE RIGHT TAKE CHLOROQUINE”: THE ILLIBERAL INSTRUMENTALISATION OF SCIENTIFIC DEBATES DURING THE COVID-19 PANDEMIC IN BRASIL

Thaiane Oliveira , Simone Evangelista , Marcelo Alves  and Rodrigo Quinan 

*Since the beginning of the COVID-19 pandemic, the Brazilian government has undergone a significant political dispute over the use of hydroxychloroquine as a measure to confront the disease and contested scientific and healthcare organisations findings related to the drug's effectiveness. In this article, we seek to understand the manner in which an illiberal populist government and the supporters thereof refer to scientific discourse during the pandemic, with a focus on the debates on Brazilian far-right networks on Twitter. Using a mixed methodology with statistical methods, social media analysis, natural language processing and qualitative content analysis, this study seeks to investigate which sources and stakeholders were referenced and the narratives that structured the arguments of far-right supporters who defended the use of hydroxychloroquine. The results highlight the use of sources that are ideologically aligned to the right and a reconfiguration of scientific authority that was supported by illiberal values. Among the main discourses, we observed an epistemic challenge with a partisan bias, which led to the scientific authority legitimising some arguments and discrediting others. We also identified the spread of conspiracy theories that reflected the epistemic challenge, in addition to conservative, revivalist and individualistic postures.*

**KEYWORDS** science-related populism; illiberal populism; epistemic crisis; Twitter; mixed methodology

## Introduction

Despite not being an unprecedented phenomenon (Bolsen and Druckman 2015; Gauchat 2012), the politicisation of scientific debate reached new heights during the COVID-19 pandemic. Amid the real-time dissemination of strategies to combat the virus, a number of government officials defended controversial measures, such as refusing to implement lockdowns (Callaghan 2020); another topic of contention was the use of hydroxychloroquine.

Used in the treatment of such diseases as malaria and lupus, this drug was identified in initial research as a promising medical intervention to combat the most serious symptoms of COVID-19. Despite the need for more robust studies, two presidents stood out for their immediate defense of the medicine: Donald Trump in the United States and Jair Bolsonaro in Brasil (Paz 2020). Despite criticism of the lack of scientific evidence on the effectiveness of this strategy, Bolsonaro sought to simplify the situation for voters: “Those on the right take chloroquine; those on the left take *tubaina* [a regional soft drink]” (UOL Notícias 2020). In an effort to reduce the public’s perception of the lethality of the pandemic, Jair Bolsonaro called COVID-19 a “*gripezinha*” (“little flu”), and he went as far as to claim that Brazilians were afraid because they were “*maricas*”<sup>1</sup> (BBC Brasil 2020).

This delegitimisation of scientific evidence and data has been recurrent with the current president of Brasil, who has made efforts since the beginning of his administration to attack and discredit the epistemic institutions that are responsible for producing and disseminating knowledge and information. But what does scientific delegitimisation represent in a far-right-wing government? Is this epistemic crisis a manifestation of denialism and scientific scepticism?

In a time of epistemic crisis and illiberal turn, we aim to investigate the manner in which science-related narratives are communicated through social networks to reconfigure the digital public sphere. Specifically, we analysed how supporters of right-wing populist governments that defended ineffective COVID-19 treatments referred to scientific discourse during the pandemic. The present research focused on the circulation of tweets in Brasil during the period of March through June 2020, during which a progressively intensifying first wave of the pandemic spread through the country. We sought to identify which actors gained visibility, which sources were used and which narratives gained prominence in the debate surrounding the use of chloroquine and hydroxychloroquine—medications that were largely defended by the Brazilian government as a preventive treatment to the infection.

We argue that such a phenomenon was part of a global epistemic crisis triggered by the populist contestation of science (Mede and Schäfer 2020), which gained illiberal contours in the discourse that was propagated by the far right. By contesting science, illiberal populist leaders and parties attempted to re-nationalise the contours of the digital public sphere in order control who exercised the role of gatekeeper of the democratic public sphere, whether as journalists, scientists or experts. In this re-nationalised digital public sphere, political leaders gained visibility in the digital environment and formed a homophobic ecosystem with their supporters.

### **Illiberal Populism Related to Science and the Context of the Epistemic Crisis in Brasil**

The concept of the public sphere has been central to contemplation of the new public-participation spaces that have been brought about by the popularisation of the internet (Papacharissi 2008). The notion of the public sphere, which was initially proposed by Jürgen Habermas (1991), represents a social dimension that serves as a mediator between the State and society, in which the public organises itself into a carrier of public opinion.

The popularity of social media platforms has driven communication and society researchers to rethink the contours of the public sphere (Gerhards and Schäfer 2010). This reconfiguration of the digital public arena is fundamental to understand how new

experts from outside of the scientific field (Collins and Evans 2002), learn to create alternative epistemologies (Cefai 2017) and contest traditional epistemic institutions that were previously recognised as being responsible for producing or disseminating socially legitimate knowledge that can act in conjunction with the state for the production of policies (Soares and Vitelli 2016). This popularisation of the digital public arena has arguably enhanced political polarisation (Yarchi, Baden, and Kligler-Vilenchik 2020); this polarisation has also been observed in the realms of science, health and the environment (Boykoff 2013; Bucchi 1996; Lörcher and Taddicken 2017).

Apart from the pluralisation of actors who challenge scientific authority, the digital public sphere has also facilitated the political instrumentalisation of science, especially in a context of enhanced polarisation and of the contestation of epistemic institutions (Albuquerque and Quinan 2019; Oliveira 2020). It is in this context that new informants of “alternative knowledge” have emerged in the public debate on science in digital environments and provided partisan and biased information in an effort to challenge the scientific consensus and discredit scientific truth (Oliveira 2020).

Since 2013, Brasil has undergone an institutional crisis, which has affected the manner in which public opinion manifests itself in relation to epistemic institutions, especially media and science. A survey conducted with PoderData (Nobrega 2020) pointed to the growth of confidence indexes in the press in recent years. Another survey conducted by the Wellcome Global Monitor (2019) in conjunction with the Gallup Institute found that 35 per cent of Brazilians did not trust science, and 1-in-4 thought that scientific production did not contribute to the country.

Mistrust in the press, in science and in the fundamental institutions of democracy was the political banner chosen by Jair Messias Bolsonaro in his 2018 election campaign and has remained since he began his mandate in January 2019. His authoritarian agenda of epistemic contestation is marked by the politicisation of the debate on medicines (Oliveira, Quinan, and Toth 2020); attempts to discredit scientific institutions (Araújo and Oliveira 2020; Hunter and Power 2019); attacks on journalists; and support of right-wing extremist groups, such as neo-Pentecostals, rural industrialists and gun-rights advocates (Cioccarelli and Persichetti 2019). This attitude is part of an epistemic crisis, as a populist project under an illiberal turn that aimed to weaken a democratic regime through the delegitimation of epistemic institutions (Galpin and Trenz 2019; Hunter and Power 2019; Albuquerque 2021). In this illiberal turn, individual rights overlap with collective rights, and the will of the people is manifested through the suppression of diversity in civil society. This suppression coincides with the weakening of trust in intermediary institutions, such as the press and scientific evidence.

Understanding how supporters of the Brazilian government undermined trust in science during the COVID-19 pandemic can therefore elucidate important clues about the relationship between illiberal democracies and epistemic crises in re-nationalised digital public spheres.

## Methods

This research is based on mixed-methodological procedures that combined statistical methods, social-media analysis, natural language processing and a qualitative analysis. The techniques were applied from replicable scripts developed by the authors in the statistical programming language R.

The original database was extracted from queries to the Twitter Search API, which were performed by the *rtweet* package (Kearney 2019). In this endeavour, the searches collected tweets that mentioned at least one of the following keywords in Brazilian Portuguese: *cloroquina*, *#cloroquina*, *hidroxicloroquina* and/or *#hidroxicloroquina*. The extraction was carried out by weekly queries in Twitter Search API conducted between March 1 and June 10; the result was  $n = 994,094$  tweets that were published in 334,920 unique accounts. The data were then pre-processed to remove duplicates and stored in an SQL database.

The collected data comprise a representative sample of all the messages published about chloroquine on Brazilian Twitter. For purposes of this investigation, we narrowed down the sample by distinguishing clusters of users who identified as supporters of President Jair Messias Bolsonaro. To facilitate this effort, we modelled data to create nodes, such as Twitter profiles and links, from the actions of mentions and RTs, after which the data were exported in *graphml* format. The networks were processed with the Gephi software programme using the Force Atlas 2 distribution algorithm, and the nodes were sized according to input degree. We subsequently applied the Louvain community partitioning method devised by Blondel et al. (2008) to determine which clusters demonstrated the highest tolerance rate to form larger groups.

The empirical research was based on two sampling procedures. The first process utilised textual analysis and metadata to identify which voices and arguments were used to support positions that defended the application of chloroquine as a treatment for COVID-19; this was done in two ways. First, mentions are a simple quantification of the textual markings of Twitter accounts using the *@username* syntax; even though this metadata were a shortcut to find the most cited actors, it did not identify those without a Twitter account or those who were referenced in the texts of the tweets. For this reason, we also used the named-entity-recognition technique of natural language processing<sup>2</sup> through the *spacyR* package to determine the people and organisations that are frequently referenced in the message (Welbers, Van Atteveldt, and Benoit 2017).

The second sampling strategy studied the information sources that were cited in the tweets through external links to Twitter to assess whether the references were composed of hyper-partisan newspapers and contradictory scientific studies. To do this, we applied the regular expression technique<sup>3</sup> to discern the domains of the hyperlinks mentioned in the tweets.

The qualitative analysis of the tweets was conducted through manual coding and used native and analytical categories, which were derived from the existing literature on epistemic crises and science-related populism in the context of illiberal turnaround. The qualitative content analysis was also carried out as an inductive category development measure (Mayring 2000); we analysed 500 tweets to identify the discursive predominance from each text.

## Results

The presentation of the findings is divided into three parts: (a) information domains and links used to support the Bolsonaro Administration's narrative that was in favour of chloroquine; (b) the main actors and the contexts in which they were cited; and (c) the

categories derived from the qualitative analysis of the tweets, which organised the conversation in the network.

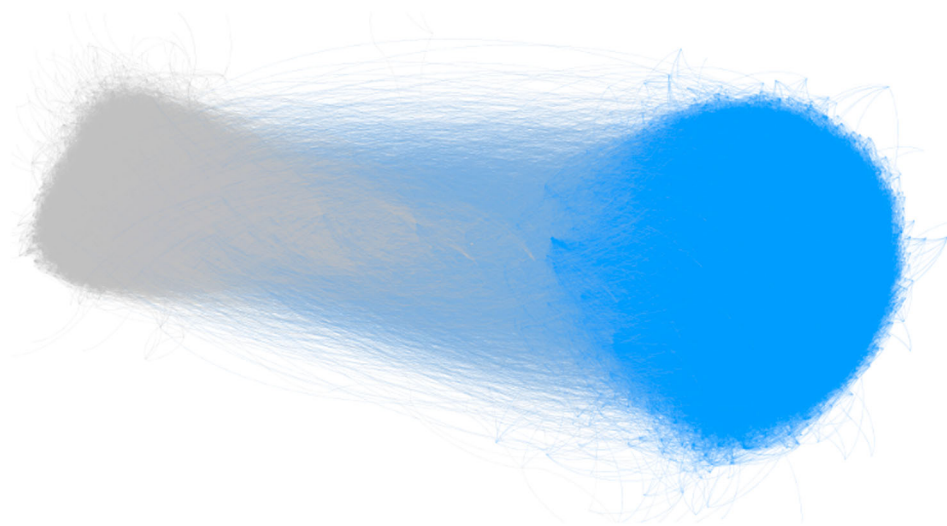
### *Selection of the Far-Right Network*

As the first step in the present research, a network was generated to identify the cluster related to the far right in the collected corpus.

Figure 1 depicts an almost clear-cut division between Bolsonaro supporters and far-right activists and the rest of the public conversation on Twitter. The network structure forms a polarised topology that was divided into two large groups: The first, which is shown in grey (light grey in the print version of this article), is a grouping of profiles that were significantly different from one another, including journalists, opposition politicians, artists and activists. The second, which is shown in blue (dark grey in the print version of this article), is a cohesive cluster that includes the main Bolsonaro supporters, such as the president's family, Eduardo, Carlos and Flávio Bolsonaro; conservative journalists Leandro Ruschel, Allan dos Santos, Bernardo Küster and Oswaldo Eustáquio; far-right press *Renova Mídia*, the *Jornal da Cidade Online* and *Brasil sem Medo*; and the Bolsonaro Congressional support base, including Beatriz Kicis, Marco Feliciano and Carla Zambelli, among others.

There were 15,552 users in the blue cluster who produced 303,001 tweets; this subsample will be used to conduct a further textual analysis of the Brazilian right-wing discourse related to chloroquine and the COVID-19 pandemic. The validation of this network as an excerpt of Bolsonaro supportive discourse was completed through manual checks of the most cited and retweeted profiles in the cluster and by identifying the most cited hashtags in the profiles.

Table 1 indicates that five of the 10 most-often published hashtags expressed support for the president and defended his positions during the COVID-19 pandemic,



**FIGURE 1:** Modularity analysis result on Gephi. **Source:** Twitter data and authors' own work

**TABLE 1:**  
Most-frequently used hashtags in Bolsonaro-supporters cluster

Hashtags	Number
#cloroquina	2,497
#coronavírus	1,007
#patriotascombolsonaro	761
#covid19	757
#coronavírusplantão	487
#fehadocombolsonaro	482
#bolsonaroestavacerto	454
#bolsonarotemraza	395
#bolsonarotrabalhapelopovo	374
#pânico	324

**Source:** Twitter data and authors' work.

such as #PatriotascomBolsonaro (#PatriotsWithBolsonaro), #FechadocomBolsonaro (#WithBolsonaro), #BolsonaroEstavaCerto (#BolsonaroWasRight), #BolsonaroTemRazão (#BolsonarolsRight) and #BolsoanroTrabalhapeloPovo (#BolsonaroWorksForThePeople). Thus, the lexical set offered compelling evidence that confirmed the sample carried out by the Louvain modularity algorithm. A final database of 303,001 tweets was used for the analysis.

### *Information Domains*

The first aspect to be highlighted was the external sources to which the Bolsonaro supporters referred to support their defense of chloroquine as a viable drug for the treatment of COVID-19. The study of hyperlinks proved to be important because it both demonstrated the connectivity of Twitter and other platforms and websites and indicated the sources and information inputs that were recommended by the actors (Table 2).

The partisan nature of the references is readily apparent. Among the 10 most-cited domains, we identified YouTube, the professional press (i.e. UOL and Folha de S. Paulo) and seven portals that systematically act in defense of the Bolsonaro government. The most-often mentioned newspaper was *Gazeta do Povo*, a traditional outlet from southern Brasil that changed its editorial line in recent years and transformed from a regional newspaper in the state of Paraná to a self-defined conservative voice with nationwide circulation (Tavares 2020). The most tweeted news article published by *Gazeta do Povo* relevant to the data echoed an open letter to President Bolsonaro published in the right-wing *Brasil Sem Medo* outlet that was signed by 13 doctors who were trained at national universities of excellence, who argued in favour of adopting chloroquine: "Dear Mr. President, it is time for HYDROXYCHLOROQUINE!" (Drechsel 2020).

It should be noted that the letter appropriates scientific authority in different ways to strengthen the argument. It did not oppose science, nor did it deny the validity of scientific knowledge. In this context, the partisan-political instrumentalisation of the aforementioned illiberal turn and epistemic crises outlined a project to occupy the scientific field and sought authority through the use of scientific language and standards. It is no coincidence that a significant proportion of the government's technical positions today were not composed by specialists with recognised knowledge in their fields, but by the military and supporters of the extreme right. After political battles with two previous ministers—Luiz

**TABLE 2:**  
Most-frequently cited domains in Bolsonaro-supporters cluster

Domain	Tweets
gazetadopovo.com.br <sup>a</sup>	2,527
noticias.uol.com.br <sup>b</sup>	2,024
republicadecuritiba.net <sup>c</sup>	1,843
gazetabrasil.com.br <sup>d</sup>	1,421
conexaopolitica.com.br <sup>e</sup>	1,327
youtube.com	1,234
folha.uol <sup>f</sup>	1,165
jornaldacidadeonline.com.br <sup>g</sup>	1,033
brasilsemmedo.com <sup>h</sup>	1,025
revistaoste.com <sup>i</sup>	1,023

<sup>a</sup>Founded in 1919, this newspaper became an important vehicle for Brazilian conservatism after an abrupt shift in political position that began in 2015 (Instituto Humanitas Unisinos 2020).

<sup>b</sup>Wide-ranging news portal.

<sup>c</sup>Created in 2018, this website presents itself as an independent tool for disseminating and supporting Operation Car Wash (Operação Lava Jato), which was a set of controversial investigations led by then-judge Sérgio Moro, who was called to occupy the Ministry of Justice and Public Security during Bolsonaro's term, and later broke after internal political fights in which the minister accused the president of demanding control of the federal police, which was under the administration of Moro's ministry. Moro became known for leading the operations, which served more than a thousand search-and-seizure and arrest warrants, including to former president Luiz Inácio Lula da Silva, who was considered the strongest candidate to win the 2018 elections in which Bolsonaro was elected. The page is available in: <https://republicadecuritiba.net/sobre>.

<sup>d</sup>Daily Brazilian newspaper published in São Paulo. Although there is no explicit mention of his political-party positioning, the content and framing on the portal implies support for Bolsonaro, including a store selling products, such as mugs and t-shirts, with supportive memes for the current president and images of nationalist exaltation: <https://loja.gazetabrasil.com.br>.

<sup>e</sup>Brazilian site known for being aligned with the Bolsonaro government and spreading disinformation (Gomes 2020). <http://conexaopolitica.com.br>.

<sup>f</sup>Daily Brazilian newspaper with the largest circulation in the country; published in São Paulo since 1921. Folha follows a neoliberal agenda aligned with the center-right, notably opposing the years of the ruling Workers' Party, but also opposing Jair Bolsonaro after his election (Albuquerque 2019). <https://www.folha.uol.com.br>.

<sup>g</sup>News website aligned with the Jair Bolsonaro government; investigated for the spread of disinformation (Ribeiro and Menezes 2019). <https://www.jornaldacidadeonline.com.br>.

<sup>h</sup>Conservative newspaper; Olavo de Carvalho, an important advisor of Bolsonaro government, is president of its editorial board (de Sá 2019). <https://brasilsemmedo.com>.

<sup>i</sup>Conservative magazine with reports that have classified as disinformation by Facebook and fact-checking agencies like Agência Aos Fatos (Scardoelli 2021). <https://revistaoste.com>.

Henrique Mandetta and Nelson Teich, neither of whom supported hydroxychloroquine distribution measures as a treatment for COVID-19—the position of the health minister has been held by Eduardo Pazuello, a Divisional general in the Brazilian army, since 15 May 2020. In addition to supporting the use of hydroxychloroquine, the new minister was also involved in the decision to remove public data of COVID-19-related deaths and practices that promoted disinformation about the pandemic.



To support the appearance of scientific authority, the researchers and physicians who signed the letter referred to their alma maters or registration numbers in the Regional Council of Medicine. Another aspect is the use of two graphs from the “Our World in Data” project<sup>4</sup> as evidence that countries that adopted chloroquine had fewer deaths.

Finally, the letter also mentioned studies by the French physician Didier Raoult as a scientific reference to defend their position. The citation of open letters or statements by physician and specialists is a very common practice that has appeared in other frequently used links that served as references to Bolsonaro supporters. The second-most-widely circulated news article on *Gazeta do Povo* reported the statement of cardiologist Costantino Costantini, in which he defended the application of chloroquine within the first 24h of symptoms (Pereira 2020). The third addressed the letter sent by the Brazilian Society of Cancerology to the Ministry of Health, which recommended the use of chloroquine in the first days of the disease. In this way, a *modus operandi* based on providing visibility to the interpretations and speeches of stakeholders who derive their authority from the scientific field itself.

Among the list of websites, there are also some newer native digital portals that almost exclusively defend Bolsonaro, including *República de Curitiba*, *Gazeta Brasil*, *Conexão Política* and *Jornal da Cidade Online*. These media vehicles stand out because of the extrapolation of the techniques of disinformation and politicisation of science. This can be seen in a widely disseminated headline: “Treated with Chloroquine, a 97-year-old woman is cured in São Paulo,” the text of which was based on a finding by *Grupo Globo G1’s* news portal (Lüder 2020), which demonstrated a case of patient improvement. Although the physicians who were interviewed reported that they administered chloroquine, they did not associate the woman’s cure with the drug, nor is such information in the headline of the G1 article. The news was copied and modified by the network in several ways and presented this case as proof of the effectiveness of chloroquine.

Other news published by the Bolsonaro-supporting websites attempted to discredit a researcher who conducted a study on chloroquine, which did not prove to be effective and resulted in the deaths of 11 patients. The author was portrayed as having forged his profession certification and being a Workers’ Party supporter (Becker 2020). In this particular text, there was a complaint by physician Nise Yamaguchi, who holds a PhD in Medicine from Universidade de São Paulo (USP) and defended chloroquine, in which she criticised the research that was published in pre-print from *The British Medical Journal*. The set of news articles highlights a well-known tactic of the Brazilian far-right to destroy people’s reputations by distortions or false news and the construction of counter-narratives to encourage the defense of Bolsonaro’s supporters (Alves 2019).

A final consideration that deserves attention is that professional journalism stories are often cited by the pro-chloroquine network. For example, the most shared story was an interview with physician Nise Yamaguchi that was conducted by *Folha’s* columnist Schelp (2020), with the headline: “Medical insurance plans that adopted chloroquine have emptied their ICUs [Intensive Care Units].” Despite receiving disrespect and hatred from Bolsonaro, *Folha* headlines that favoured the view of the president’s supporters were quoted online.

This finding has the potential to broaden the understanding of news segregation and social-media polarisation. It is logical to posit that quality press would be ignored by the

**TABLE 3:**  
Most-frequently cited domains in Bolsonaro-supporters cluster

Mention	Tweets
leandroruschel	14,128
conexaopolitica	11,022
AiltonBenedito	10,653
marcofeliciano	8,132
ArthurWeint	7,129
oswaldojor	6,851
majorfabianadep	6,592
allantercalivre	5,996
bernardopkuster	5,455
bibonunes1	5,433

*Source:* Twitter data and authors' work.

far-right echo chambers, considering the positive feedback loop behaviour from its members. Nevertheless, declaratory journalism from the same criticised sources was praised by bolsonaristas when it favoured their overall narrative.

### *Actors*

The actors were identified in two ways: (a) @mentions of profiles that exist on the platform; and (b) people and organisations that were cited in tweets. The most-frequently cited Twitter accounts belonged to actors who either hold a public office or are part of the pro-government network. The data for the 10 most mentioned profiles are presented in Table 3.

The top five most-frequently cited accounts belonged to public officials; among these were federal prosecutor Ailton Benedito, who was the former Secretary of Human Rights of the Federal Public Ministry of Goiás. Although he held a position in the justice system, Benedito was known on Twitter for his openly right-wing and critical views on journalism. He indicted journalists and filed an action against the fact-checking agency Aos Fatos for citing him in a report that investigated misinformation related to chloroquine. Other visible domains by public officials belonged to members of Congress Bibo Nunes, Marco Feliciano, Major Fabiana and the former special advisor to the president of the

**TABLE 4:**  
Most-frequently cited persons in Bolsonaro-supporters cluster

Person	Tweets
Bolsonaro	1,268
Mandetta	650
Donald Trump	224
David Uip	207
Nelson Teich	145
Nise Yamaguchi	104
Paolo Zanotto	97
João Doria	92
Roberto Kalil	84
Rodrigo Constantino	82

*Source:* Twitter data and authors' work.

republic, Arthur Weintraub. Everyone echoed Bolsonaro's speech in defense of chloroquine and attacked state governors and reporters; Bibó Nunes went so far as to refer to the drug as "Bolsonaro's medicine."

The remaining five domains of the right-wing journalism network on Twitter belonged to the *Conexão Política* website, one of the stauncher defenders of the president; Leandro Ruschel, the editor of the *Brasil sem Medo* website, who has also produced revisionist documentaries on Brazilian history; Oswaldo Eustáquio, a blogger known for conspiracy theories, lies and a pro-military-coup attitude, who was arrested under determination of the Supreme Federal Court (STF); Allan dos Santos, editor of the website *Terça Livre*; and Bernardo Küster, a columnist for *Brasil Sem Medo*. This group represents the effort to spread disinformation about the pandemic and vaccines and informational war narratives that aimed to confuse the public space.

An entity-recognition analysis was added to this study because it relates to the visibility of actors by identifying the most-frequently cited persons in the tweets. These are persons who were categorised by the Bolsonaro network as either allies or adversaries, but who were not linked to through the use of a name tag (for instance, because they do not have a Twitter account). Table 4 shows the ranking of the 10 most-frequently cited persons.

These results again highlighted the politicisation of public discourse related to chloroquine, and took into consideration that presidents Bolsonaro and Trump were among the most-frequently cited, in addition to the governor of São Paulo, João Dória, and the former health ministers fired during the pandemic, Henrique Mandetta and Nelson Teich. In general, the state governors appear as the target of a speech that, on the one hand, stressed the strategy of action with the federal sphere, seeking to characterise Dória as Bolsonaro's main opponent and accusing him of oversizing the pandemic with the aim of executing overpriced contracts purchase of health supplies. This narrative simultaneously seeks to hold governors responsible for the rapid and serious advance of the pandemic that, according to the Bolsonaro network, could be prevented by the mass use of chloroquine. According to Congressman Carlos Jordy, "[Even] Trump is taking hydroxychloroquine, but Dória is right for not prescribing the medicine all thanks to his feud with President Bolsonaro" (tweet no. 2).

Moreover, some of the listed physicians and specialists used their scientific authority to express opinions in favour of chloroquine; this is clear from the number of references to Nise Yamaguchi's (USP) interviews, as in Oswaldo Eustáquio's tweet:

The discovery of the Lancet study's fraud and the evidence that asymptomatic people do not have a strong contamination power from COVID-19 prove that Bolsonaro and Nise Yamaguchi are right. Nise has become a benchmark worldwide. Her love for Brazilians has touched the nation. Chloroquine saves lives. (tweet no. 3)

In the same vein, mention is made of Paolo Marinho Zanotto (USP), who has published videos on his networks defending the drug.

### *Categories*

To understand the narratives made by the supporters of the far right in relation to hydroxychloroquine, a manual coding was applied to a subsample of 500 collected tweets. The investigation aimed to identify, based on the speech that is presented, the

central axes for the argumentative strategies in defense of chloroquine and hydroxychloroquine among Bolsonaro's supporters.

Based on a manual qualitative analysis of the sample, we constructed five categories that allowed us to contextualise the narratives in which the stakeholders and sources mentioned above were inserted: legitimization by scientific authorities (i.e. tweets that mentioned scientific authorities like researchers and doctors to defend treatments with chloroquine and hydroxychloroquine); epistemic contestation (i.e. tweets focused on discrediting institutions and individuals that criticised those treatments); conspiracy theories (i.e. tweets that mentioned fraud and corruption accusations and omissions against institutions or instances, such as the media, which were contrary to the use of the medication); left-wing biases in science (i.e. when political disputes surrounding the pandemic were used as a key argument, instead of science); and revivalism, conservatism and individualism (i.e. when ideas connected with these values were mentioned in defense of the medicine).

These categories were not exclusive, and we eventually observed overlaps in the use of these narratives. We also sought to understand the different nuances that articulated these narratives and organised a discourse in which the decision to take chloroquine gained partisan-identitarian contours—supporting the use of chloroquine meant supporting the president, and vice versa. In the following subsections, we will explain how these categories were constituted.

*Legitimation by Scientific Authorities.* At various times, the defense of chloroquine and hydroxychloroquine was legitimised by citing physicians, researchers and other scientific authorities. Two particular Brazilian doctors and researchers were involved: virologist Paolo Zanutto from the University of São Paulo and oncologist and immunologist Nise Yamagushi, who was mentioned earlier in this text. Both gave interviews, including to outlets that were sympathetic towards the president, and published texts and videos on the efficacy of these substances in the treatment of COVID-19, with widely spread on Twitter: “Paolo Zanutto, virologist at USP, says that the use of hydroxychloroquine is the most effective method for save thousands of lives and avoid a historic tragedy” (tweet no. 1). It should be noted that Yamaguchi's and Zanutto's names had little-to-no relevance from the standpoint of scientific production and scientific dissemination in Brasil.

A recommendation from the Brazilian Society of Cancerology (SBC), which issued a document to the Ministry of Health that indicating that using these drugs alongside the antibiotic azithromycin (Adler 2020) also stood out. Finally, French academic Didier Raoult, who authored the initial, and subsequently contested, study on the effectiveness of chloroquine, was credited as “the world's greatest infectious disease specialist”: “The world's greatest infectologist says chloroquine is the cure for coronavirus [...] Supporting a particular view based on ‘science’ is stupid if you are not a scientist. There is science on both sides of the aisle” (tweet no. 4).

*Epistemic Contestation.* Conversely, as research was published that indicated that these substances would ineffectively contain the pandemic, the Bolsonaro network repeated a widely used strategy in political disputes: discrediting opposing discourses. This contestation of scientific arguments followed tactics as placing an emphasis on scientific controversies, individual experiences and dissemination of incomplete information.

Regarding the first axis, a research paper published and later withdrawn from *The Lancet* medical journal should be mentioned: “I would like to see them apologising to the relatives of the thousands who died and who could have been saved. Bastards!” (tweet no. 5). The study would prove the increased risk of death among COVID-19 patients treated with hydroxychloroquine and led to the stopping of other research on the substance at first, but was retracted due to an issue of scientific integrity (Boseley and Davey 2020). This failure was widely publicised on the network as evidence of the incompetence of the World Health Organization (WHO): “EXTRA! WHO changed the recommendations for combating COVID-19 using the wrong data from an unknown company, whose team included a science fiction writer and a porn actor” (tweet no. 6).

Fact-checking agencies that were based on the study also faced criticism:

So, the study on the ineffectiveness of CHLOROQUINE was carried out with WRONG data. Did the authors withdraw their conclusions? A lot of fact-checking agencies used this study to censor posts. Can you see the danger in blindly following any entity? (tweet no. 7)

Furthermore, this contestation was present in texts that highlighted the uncertainty of the specialists: “There is no evidence of the effectiveness of chloroquine. Well, there is no evidence either of the effectiveness of quarantines/lockdowns. Why is absolute scientific proof required in one case but not in the other?” (tweet no. 8).

Regarding the second tactic, additional biased arguments were highlighted, which were often based on the experience of the author or a third party. These included messages such as, “In my city, São José dos Campos, SP, the Chinese virus has been defeated. RESPONSIBILITY, COMPETENCY, AND HYDROXYCHLOROQUINE” (tweet no. 9).

*Conspiracy Theories.* Several tweets disseminated narratives against epistemic institutions that were based on speeches that were morally guided by ideas of omission, fraud and corruption, which targeted (i.e. certain institutions) and/or generic (i.e. “the media”) accusations. Such accusations were broadly directed against media companies—particularly *Rede Globo*, which is the most influential media organisation in Brasil—and against such organisations as the World Health Organisation (WHO): “[The] WHO has already proved to be a major Chinese-run farce. [...] That is why they want to censor the web: it is difficult to lie with networks still free” (tweet no. 10). In addition to contesting the disclosure of scientific research, as explained in the epistemic contestation category, the modus operandi of this argumentative construction was to question the arguments of those who criticised the use of chloroquine. These were based on moral standards, which articulated the dichotomy between virtuosity and corruption: “Globo desperately wants an increase in deaths from coronavirus! They are reporting that many die and do not say that coronavirus was the cause [...] Chloroquine is saving millions worldwide. Go cry, you vultures” (tweet no. 11).

“Chinese virus” became a frequently used expression after Donald Trump highlighted China’s blame for the spread of the virus: “The communist scum who supports the Chinese virus joined the Supreme Court to bar President Bolsonaro from talking about chloroquine” (tweet no. 12). For those who proposed and defended these theories, governmental institutions were involved in multinational pacts and were manipulating information to obtain political and economic advantages:

Thousands of people are curing themselves around the world with the use of chloroquine. Hope is renewed. The cure, however, does not sell newspapers. We live in a kind of world where death is more attractive. Hope and faith will win! #BolsonaroTemRazao (#Bolsonar-oiright). (tweet no. 13)

*Left-wing Bias and the Politicisation of Science.* Explicit mentions of political disputes related to the pandemic also appeared as a key argument against chloroquine and hydroxychloroquine advocates. Tweets like, “Chloroquine and Azithromycin put an end to bribery. Right? #BolsonaroTrabalhaPeloPovo (#BolsonaroWorksForThePeople)” (tweet no. 14) reinforced the need for anti-corruption measures, which was one of the pillars of Bolsonaro’s election. Moreover, economic argument was triggered to justify the choice to take the medication:

Chloroquine is refuted by the left for the reasons: 1) It is cheap, so it does not make a profit; 2) it saves lives, so it is not possible to engage in fraudulent overpricing with field hospitals and respirators; and 3) it was publicised by Bolsonaro. The ‘science’ label is used to mask political and financial interests. (tweet no. 15)

Figures who were outside of the scientific field were also mentioned to legitimise the treatment. Former President Donald Trump was particularly mentioned: “Trump is in the risk group. He is the most powerful president in the world and is using hydroxychloroquine prophylactically. Those who still believe in the press and the scientists bought by the lobby should get bent themselves” (tweet no. 16). A study on the side effects of high chloroquine dosage in the city of Manaus was considered to be an example of left-wing bias in science, communist pamphleteering and support for the Workers’ Party, the main political force of the Brazilian left, and linked to corruption scandals.

*Revivalism, Conservatism and Individualism.* On a smaller scale, arguments that promoted strong dialogues about the values of military revival, and conservatism and individualism were also recorded. Regarding the former, there were tweets about the performance of the Brazilian army, which expanded production of the medicine during the pandemic: “The Army is preparing for war! 2.2 million chloroquine tablets have already been produced, and production is expected to be expanded. The enemy is the coronavirus, and the production of our weapon is in full swing. We will win!” (tweet no. 17). Additionally, associations between Jair Bolsonaro’s stance and a war effort were also made: “Surrender! Lose the war without fighting! In short, this is the suggestion of those who tell us to stop Brasil for the coronavirus, hiding in fear at home. PR @jairbolsonaro, as a good military man, wants to win the war!” (tweet no. 18).

Finally, calls for individual freedom were evoked. Given the lack of evidence about the harm of chloroquine, many felt that it should be up to each citizen to decide whether or not to take the medication: “I am not a great enthusiast of chloroquine, but it is largely harmless” (tweet no. 19). In this sense, a tweet from the Ministry of Health stands out:

The guidance for the use of treatment with chloroquine and hydroxychloroquine gives the patient freedom of choice, guides the medical team in the dosage for each case and makes the treatment available to the entire Brazilian population. This is the Government of Brazil giving equal opportunity to everyone! (tweet no. 20)

## Final Discussion and Observations

We began this article by considering the problem of delegitimising science knowledge as a component of an epistemic crisis, which was observed in many countries during the COVID-19 pandemic. Even though epistemic delegitimation is understood as part of the crisis of the liberal democratic system (Schäfer 2015), it is occurring across several political systems, especially those that appear to be close to illiberal populism; in this type of political system, we observed strategies of the political leadership to not only discredit the epistemic institutions that should exercise the role of gatekeepers in the public sphere, but also to re-nationalise the digital public sphere by legitimising actors who shared the same political values and in doing so, forming a news media homophilic ecosystem.

In addition to taking a stand against scientific institutions, we also observed far-right leaders and their supporters gradually reconfiguring scientific authority. This was a highly charged moral discourse that was centred around the idea of virtuous people going up against a potentially corruptible academic elite, and it affected the manner in which science-related populism was understood (Mede and Schäfer 2020). While people legitimised scientists who were aligned with their conservative values and appropriated scientific output and clinical trials reports and adapted the content to suit their narrative and confirm their arguments, research results that did not confirm their beliefs and supported budget cuts for research in public scientific institutions were delegitimised. As they discredited scientific institutions and universities, they replaced specialised knowledge with government supporters and occupied spaces in democratic institutions.

More than a Brazilian particularity, this research revealed that the epistemic delegitimation is more than a political strategy used to deny epistemic authorities. In a populist-based illiberal democracy, the trend of which is growing around the world, delegitimation is seen as a way to re-nationalise the digital public sphere in homophilic digital spaces and to take back control of epistemic institutions, such as science and the media, which should be gatekeepers of the public sphere (Brzechczyn 2020; Plattner 2019; Surowiec and Štětka 2020). This is not a denial of science *per se*, since leaders use scientific authority as a discourse to reinforce their science-related decision-making. This is part of a complex process in which symbolic elements of value within the scientific field, such as professional degrees, certificates or specialised knowledge, are subverted.

We can also observe the process of re-nationalise public sphere and taking back control of the democratic institutions in illiberal democracies is a recurring practice in which the Brazilian government invites people who lack technical competence or who have forged diplomas to occupy positions in public offices (Jucá 2020). For this indication to public office and to reinforce their arguments, illiberal populist leaders seek to influence people through visibility and popularity efforts that are promoted by media that are ideologically aligned and share the same values and on social media.

This study had some limitations. As it relates to methodological issues, even though manual coding was conducted by two internal reviewers who worked independently, accuracy should have been further ensured with Natural Language Processing, which would have presented a broader scope than simply the number of analysed tweets.

The political-party instrumentalisation of science is not solely a feature of far-right leaders. Under the argument that the world is polarised, politicians present and legitimise themselves as a third way on the polarised political spectrum. Additional studies of the

political spectrum can provide important data that will lead to a better understanding of the manner in which science is also instrumentalised by people who are not considered far-right, but who share similar values with right-wing. Transnational comparative studies can provide greater clarity regarding disputes in the process of re-nationalising the digital public sphere in other countries and can offer valuable clues to better understand how the illiberal far-right is advancing in the world.

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## NOTES

1. A pejorative term used in colloquial language to refer to men with effeminate behaviour as a reference to cowardly and fearful postures.
2. Computational analysis that applies trained models to identify and categorise entities in a text, such as person, organisation and location.
3. "Regular expression" is a computational technique to locate and match texts based on previously defined criteria. In this case, we applied textual patterns to detect URLs in the text.
4. <https://ourworldindata.org/>.

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1. <https://twitter.com/opropriolavo/status/1246090086787223553> (accessed 26 March, 2021).
2. <https://twitter.com/carlosjordy/status/1262531789362475008> (accessed 26 March, 2021).
3. <https://twitter.com/oswaldojor/status/1270795296725962752> (accessed 26 March, 2021).
4. <https://twitter.com/roxmo/status/1265690338536108033> (accessed 26 March, 2021).
5. <https://twitter.com/majorfabianadep/status/1269375294827368450> (accessed 26 March, 2021).
6. <https://twitter.com/rmotta2/status/1268167540301336576> (accessed 26 March, 2021).
7. <https://twitter.com/leandroruschel/status/1268622214909161472> (accessed 26 March 2021).
8. <https://twitter.com/leandroruschel/status/1262892205695553537> (accessed 26 March 2021).



9. <https://twitter.com/mitags/status/1262156024146001921> (accessed 26 March, 2021).
10. <https://twitter.com/leandroruschel/status/1268670482133508101> (accessed 26 March, 2021).
11. <https://twitter.com/bibonunes1/status/1250207287182057472> (accessed 26 March, 2021).
12. <https://twitter.com/criticanac/status/1252684195148836865> (accessed 26 March, 2021).
13. <https://twitter.com/marcofeliciano/status/1249781982839689218> (accessed 26 March, 2021).
14. <https://twitter.com/leobolsoneas/status/1264698318871035904> (accessed 26 March, 2021).
15. <https://twitter.com/brunaobarreto/status/1269588872423448577> (accessed 26 March, 2021).
16. <https://twitter.com/dimacgarcia/status/1262524856249257994> (accessed 26 March, 2021).
17. <https://twitter.com/capitaoderrite/status/1250192963210227712> (accessed 26 March, 2021).
18. <https://twitter.com/marcofeliciano/status/1248677372804706304> (accessed 26 March, 2021).
19. <https://twitter.com/lnarloch/status/1246131698422755334> (accessed 26 March, 2021).
20. <https://twitter.com/minsaude/status/1266093155365117953> (accessed 26 March, 2021).

## ORCID

Thaiane Oliveira  <http://orcid.org/0000-0002-8588-3548>

Simone Evangelista  <http://orcid.org/0000-0002-5457-5737>

Marcelo Alves  <http://orcid.org/0000-0003-4995-6612>

Rodrigo Quinan  <http://orcid.org/0000-0002-5344-0574>

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**Thaiane Oliveira** (corresponding author) is Professor of the Graduate Programme in Communication at Fluminense Federal University; leader of the Laboratory of Investigation in Science, Innovation, Technology and Education (CiteLab); productivity researcher at the National Council for Scientific and Technological Development (CNPq); researcher at the National Institute of Science and Technology in Comparative Studies of Conflict Management; and the UNESCO Chair on policies for multilingualism. E-mail: [thaianeoliveira@id.uff.br](mailto:thaianeoliveira@id.uff.br)

**Simone Evangelista** is a researcher and journalist with Master's and Doctorate degrees in Communication from Fluminense Federal University (PPGCOM/UFF). She is currently a post-doctoral researcher in the same institution. E-mail: [simone.evangelistacunha@gmail.com](mailto:simone.evangelistacunha@gmail.com)

**Marcelo Alves dos Santos** is a researcher in the Communication Studies Programme at Lamide (Media & Democracy Lab). E-mail: [marceloalves.ufsj@hotmail.com](mailto:marceloalves.ufsj@hotmail.com)

**Rodrigo Quinan** is a PhD candidate in Communication at Fluminense Federal University. E-mail: [rodrigoquinan@id.uff.br](mailto:rodrigoquinan@id.uff.br)