ORIGINAL ARTICLES

Information disorders: analysis of statements by Jair Bolsonaro against covid-19 vaccination

Desordens informativas: análise de pronunciamentos de Jair Bolsonaro contra a vacinação de covid-19

Trastornos de la información: análisis de las declaraciones de Jair Bolsonaro contra la vacunación contra la covid-19

Alice Agnes Spíndola Mota[1,2,a]
aliceagnes@uft.edu.br | https://orcid.org/0000-0003-2634-8374

Sidiany Mendes Pimentel[1,3,b]
sidianymp@uft.edu.br | https://orcid.org/0000-0003-2460-8443

Albertina Vieira de Melo Gomes Oliveira[1,4,c]
albertina.oliveira@uft.edu.br | https://orcid.org/0000-0002-2725-4719

[1] Federal University of Tocantins, Postgraduate Program in Communication. Palmas, TO, Brazil.
[2] Aveiro University, Department of Communication and Arts, Digital Media and Interaction Research Center. Aveiro, Portugal.
[3] Federal Tocantins Institute. Dianópolis, TO, Brazil.
[4] Federal University of Pará, Postgraduate Program in Communication. Belém, PA, Brazil.

[a] Doctoral degree in Anthropology from University Institute of Lisbon.
[b] Master of Health Sciences from Federal University of Tocantins.
[c] Master of Communication and Society from Federal University of Tocantins.

ABSTRACT

Using the concepts of "informational disorder" proposed by Claire Wardle and Hossein Derakhshan, this paper observes the phenomenon of vaccine hesitancy and the public opinion towards the CoronaVac vaccine against covid-19, from the analysis of public speeches by President Jair Bolsonaro about this immunizing agent, produced by Instituto Butantan in partnership with the Chinese biopharmaceutical company Sinovac. The speeches in question were delivered in the period from July 2020 to January 2021. Through a qualitative research approach, with exploratory and descriptive purposes, the work analyzed the content of ten statements made by the president about vaccines in the context of the first year of the covid-19 pandemic in Brazil and observed informational disorders of the following types: mal-information (17.6%), misinformation (47.1%) and disinformation (35.3%) in all speeches. The propagated informational disorders contributed to feelings of distrust and collective postures of vaccine hesitancy related to covid-19, especially in relation to CoronaVac.

Keywords: Public opinion; Public health; Disinformation; Vaccine hesitancy; Covid-19.

RESUMO

Baseando-se nos conceitos de "desordens informativas" propostos por Claire Wardle e Hossein Derakhshan, este trabalho propõe-se a observar o fenômeno de hesitação vacinal e a opinião pública em relação à vacina CoronaVac contra a covid-19, a partir da análise de falas públicas do presidente Jair Bolsonaro sobre esse imunizante produzido pelo Instituto Butantan em parceria com a biofarmacêutica chinesa Sinovac. As falas em questão foram proferidas no período de julho de 2020 a janeiro de 2021. Através de uma pesquisa de abordagem qualitativa, com finalidades exploratórias e descritivas, o trabalho analisou o conteúdo de dez pronunciamentos do então presidente sobre as vacinas no contexto do primeiro ano da pandemia de covid-19 no Brasil e observou desordens informativas dos seguintes tipos: má informação (17,6%), informação incorreta (47,1%) e desinformação (35,3%) em todas as falas. As desordens informativas propagadas contribuíram para os sentimentos de desconfiança e as posturas coletivas de hesitação vacinal relacionadas à covid-19, principalmente em relação à CoronaVac.

Palavras-chave: Opinião pública; Saúde coletiva; Desinformação; Hesitação vacinal; Covid-19.

RESUMEN

Utilizando los conceptos de "desórdenes informativos" propuestos por Claire Wardle y Hossein Derakhshan, este trabajo observa el fenómeno de la vacilación a la vacunación y la opinión pública hacia la vacuna CoronaVac contra el covid-19, a partir del análisis de los discursos públicos del presidente Jair Bolsonaro sobre este inmunizante producido por el Instituto Butantan en asociación con la biofarmacéutica china Sinovac. Los discursos en cuestión se pronunciaron en el periodo comprendido entre julio de 2020 y enero de 2021. A través de una investigación de abordaje cualitativo, con fines exploratorios y descriptivos, el trabajo analizó el contenido de diez pronunciamientos del presidente sobre vacunas en el contexto del primer año de la pandemia de covid-19 en Brasil y observó trastornos informativos de los siguientes tipos: mala información (17,6%), información incorrecta (47,1%) y desinformación (35,3%) en todos los discursos. Los trastornos informativos propagados contribuyeron a los sentimientos de desconfianza y a las posturas colectivas de indecisión vacunal relacionadas con el covid-19, especialmente en relación con CoronaVac.

Palabras clave: Opinión pública; Salud pública; Desinformación; Vacilación a la vacunación; Covid-19.

INTRODUCTION

On March 11, 2020, the World Health Organization (WHO) classified the accelerated spread of the disease covid-19, caused by the coronavirus (SARS-CoV-2), as a pandemic situation. The disease proved to be highly transmissible, clinically severe, and lethal (FREITAS; NAPIMOGA; DONALISIO, 2020), starting a worldwide scientific race for the development of a vaccine against covid-19.

Preliminary mapping carried out just three months after the notification of the first case registered the existence of 991 patents, 126 articles and 119 clinical studies. Two of these already mentioned vaccines to combat the new virus (QUINTELLA *et al.*, 2020, p. 6). In November 2020, the WHO (WHO, 2020) had already registered more than 100 vaccines against covid-19 in development. Four of them were in phase 3 of clinical trials in Brazil, a stage that evaluates the efficacy and safety of the immunobiological treatment.

On June 2, 2020, the Oxford vaccine produced by the AstraZeneca laboratory in partnership with the University of Oxford, was the first to be cleared by the National Health Surveillance Agency (Anvisa) for studies. Subsequently on July 3, 2020, studies to produce CoronaVac were authorized. It was developed by the Sinovac Research and Development Company Ltd, in partnership with the Butantan Institute. The vaccines developed by BioNTech and Wyeth/Pfizer were approved by Anvisa for research on July 21. Finally, on August 18, studies began on the vaccine produced by Johnson & Johnson's pharmaceutical division. The four clinical trials of vaccines against covid-19 under development in Brazil recruited approximately 22,000 volunteers during their first three phases (BRASIL, 2020).

On October 20, 2020, a vaccine developed by Sinovac hit the headlines in Brazil after the announcement, made by the then Minister of Health, Eduardo Pazuello, of a protocol of intent to purchase 46 million doses of the immunizing agent, which was in the final testing phase. The acquisition proposal envisaged an investment of 1.9 billion reais in vaccines that would be produced in the country by the Butantan Institute. The government of São Paulo, governed by João Doria at the time had strong links to the institute. Doria was a political opponent of the president of the republic, Jair Bolsonaro. A day after the announcement by the Ministry of Health, the president announced through a public statement that he had ordered the cancellation of the acquisition of CoronaVac doses. In the statement, the head of the government asserted that the numbers showed that the pandemic was going away and that no one would be interested in this vaccine (G1, 2020b). Later, on October 21, the executive secretary of the Ministry of Health, Elcio Franco, declared: "[...] there is no intention to purchase Chinese vaccines" (G1, 2020b), and the statement on the protocol of intent signed with Butantan was removed from the department's official website.

The episode triggered a political clash over the immunizing agent developed by the biopharmaceutical company Sinovac and reignited the public debate regarding mandatory vaccination against covid-19 and other diseases. On January 17, 2021, the governor of São Paulo announced the first vaccination against covid-19. The vaccine used was CoronaVac, approved only hours before by Anvisa, the result of the first Brazilian production aimed at combatting covid-19. In this historic event, the immunizing agent of Chinese origin once again became the focus of attention in the media and on social networks, highlighting the impacts and connections between politics, health, and vaccine hesitancy. Vaccination hesitation, or refusal, is defined as a reluctance to have a vaccine, generated by mistrust or disinformation (MACDONALD; SAGE WORKING GROUP ON VACCINE HESITANCY, 2015).

Using the concepts of "information disorders" (p. 4), proposed by Claire Wardle and Hossein Derakhshan (2017), which classify problematic information as "disinformation", "misinformation" or "mal-information" (p. 5), this work presents a reflective essay on the influence of public speeches by President Jair Bolsonaro regarding CoronaVac in the process of vaccine hesitation with this immunizing agent. This is an exploratory and descriptive research study, which proposes the identification and classification of informational

disorders in the statements made by the President of Brazil on vaccines against covid-19. The study seeks to establish a bibliographically based reflection on the possible implications of these narratives on the vaccine hesitancy phenomenon and on collective public health.

INFORMATION DISORDERS IN THE CONTEXT OF THE COVID-19 PANDEMIC

The expression fake news is of recognized social and historical relevance, having been considered 'word of the year' by the Collins English dictionary in 2017 and popularized in research and academic works since the 2016 US elections (STRONGREN, 2019, p. 68). Fake news corresponds – among its many definitions – to "information of various stripes that is presented as real but is patently false, fabricated, or exaggerated to the point where it no longer corresponds to reality" (REILLY, 2018, p. 141).

Despite the undeniable value attributed to the term, the concept of fake news has some limitations when trying to describe the complexity of the dissemination of false information on the internet, and that is why researchers Claire Wardle and Hossein Derakhshan (2017) propose the use of the word 'disinformation', which joins the ideas of 'inaccurate information' and 'mal-information'. They represent a set of information disorders.

Although information disorders are not recent phenomena, the use of the internet and social technologies has clearly brought about substantial changes in the way information is produced, communicated, and distributed (WARDLE; DERAKHSHAN, 2017, p. 11). According to Lévy (1999) technologies are "responsible for extending the possibilities of contact from one end of the world to the other" (p. 14, own translation), and, in this context, "new ways of thinking and living together are being developed" (p. 7, own translation). The author also establishes the definition of cyberspace to designate the entire digital communication infrastructure and the "oceanic universe of information that it houses, as well as the human beings who navigate and feed this universe" (p. 17, own translation). In this cyberspace, an environment for rapid worldwide dissemination of disinformation is found.

During the covid-19 pandemic, the spread of information – true and false – about the virus, vaccines under development and issues related to the pandemic increased exponentially in a short period. This excess of information, often contradictory, was named the "infodemic" and described by the WHO in partnership with the Pan American Health Organization (PAHO) as "a large increase in the volume of information associated with a specific subject, which can multiply exponentially in a short time due to a specific event" (OPAS, 2020, p. 2, own translation).

According to a study by the Center for Health Informatics at the University of Illinois (OPAS, p.4), in March 2020 alone, the month in which the WHO declared a pandemic situation, 361 million videos were published, 19,200 articles and about 550 million tweets that used the terms "coronavirus", "corona virus", "covid19", "covid-19" or "pandemic". The excess of information shared and produced daily has contributed to information disorders regarding the pandemic and related issues, since the volume of data has made access to reliable sources, quality control and reliable guidelines difficult.

The intentional dissemination of content with disinformation and mal-information on social networks is often combined with discursive strategies that seek to legitimize and increase the visibility of messages using opinion, authority or a call to action (RECUERO, 2020; SOARES, 2019; SOARES et al., 2021). This disorganized diffusion of information becomes dangerous, since the receiver of the message is no longer able to distinguish between true and false information and becomes convinced that the lie being spread is real (ARENDT, 1997).

In 2016, the Oxford Dictionary drew attention to this phenomenon by designating "post-truth" as the word of the year, an entry that describes "circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief" (WORD..., 2016). The term was used

for the first time in an article by Steve Tesich on the Gulf War (TESICH, 1992) and gained strength and visibility in the context of the 2016 US elections, when it became evident that "the contemporary idea of post-truth and disinformation driven by new ICTs (Information and Communication Technologies) can cause reduced capacity for political action in public spaces" (RUEDIGER, 2019, p. 7, own translation). This sets up a dangerous scenario in which disinformation, combined with emotional appeals and individual beliefs, points to the possibility of political actions capable of weakening social freedom and even democracy.

According to the report Internet, disinformation, and democracy (CGI.BR, 2020), the political use of disinformation as a means for gaining visibility, ideological strengthening and weakening of opposing forces is an old phenomenon, but which has gained unforeseen proportions with the advancement of the internet. In the second decade of the 2000s, it was observed that in the political sphere "fake news and statements left the field of journalism to be used as an electoral marketing tactic" (GALHARDI et al., 2020, p. 4202), with a hit able to reach thousands of people without its origins ever being identified. The impact of these messages causes growing concerns, especially "after the 2016 elections in the USA and the Brexit referendum in the United Kingdom" (CGI.BR, 2020, p. 11), when the political use of disinformation in election campaigns became evident (RUEDIGER, 2019, p. 5).

The covid-19 pandemic in 2020 pointed to new dangers related to disinformation. The spread of false and inaccurate information on social media became a threat to public health. In Brazil, this issue took on even greater significance with the role of the president of the republic, Jair Bolsonaro, as a propagator and defender of informational disorders related to the origins of the coronavirus, the spread of the virus and forms of treatment.

Since March 11, 2020, when the WHO declared a pandemic situation, President Bolsonaro has made several statements with misleading content on national television, even stating on different occasions that the pandemic was in fact, "just a little flu" and that the drug hydroxychloroquine would be "the cure for coronavirus" (BOLSONARO…, 2020b), even without scientific evidence in this regard and in the face of expert warnings about the ineffectiveness of the medicine and the risky side effects. According to data from the information-checking agency Aos Fatos (FREITAS et al., 2022), in the first six months of the pandemic alone, the head of the Brazilian executive officially disclosed 653 false or distorted items of information about the coronavirus and the fight against the pandemic – this number reached 1014 on January 19, 2021 (FREITAS et al., 2022).

With the biotechnological race for the development of a vaccine, the political war of disinformation intensified. In October 2020, President Jair Bolsonaro publicly positioned himself against the vaccine developed by the Butantan Institute in partnership with Sinovac – CoronaVac. On several occasions, the president questioned the effectiveness of the immunizing agent and clearly drew attention to the ideological clash surrounding the vaccine by calling it "João Doria's Chinese vaccine" during an interview (BOLSONARO…, 2020a).

In the six-month period, between July 2020 and January 2021, the head of the executive of Brazil criticized CoronaVac publicly on at least ten occasions (GULLINO, 2021). The politicization of CoronaVac and the disinformation released about the immunizing agent by the president of Brazil had a significant impact on social networks and public opinion, pointing to worrying issues in relation to collective health. In a survey of disinformation related to the cure for covid-19, Recuero et al. (2021) showed the partisan perspective associated with the propagation and indication of the drug hydroxychloroquine as a form of treatment for the disease, without scientific proof:

> […] we identified that Jair Bolsonaro's statement about the "cure" for the virus had a direct influence on conversations, since at first messages refuting false information were center stage. This changed, with disinformation gaining visibility after statements made by the Brazilian president (RECUERO; SOARES, 2021, p. 24, own translation).

The worrying public health scenario in Brazil, characterized by the federal government's position of tackling the covid-19 pandemic by suggesting a treatment proven to be ineffective (CAVALCANTI *et al.*, 2020) and not providing any encouragement to adhere to the WHO's suggested health protocols, was aggravated by the president's speeches in relation to vaccines, mainly in relation to CoronaVac. Through disinformation, such as the statement made on November 10, 2020, when he stated that the "Doria vaccine" caused "death, disability and anomaly" (GULLINO, 2020), or through poorly informed speeches, such as the statement on January 13, 2020, when he referred to CoronaVac as "the 50% one" (BOLSONARO..., 2021) in allusion to possible low effectiveness of the immunizing agent, Jair Bolsonaro contributed to the strengthening of vaccine hesitancy (MACDONALD; SAGE WORKING GROUP ON VACCINE HESITANCY, 2015) – a proven social phenomenon that can provoke severe damage to collective health.

A survey carried out between October 26 and 28, 2021 with 2,500 Brazilians in 488 municipalities revealed that covid vaccine rejection had increased from 8% to 22% in a period of four months (BARBOSA, 2020). Supporting evidence came from a study carried out by researchers at the University of Brasília where among 2,771 Brazilians the intention to vaccinate with immunizing agents from China fell by 16.4% (GRAMACHO; TURGEON, 2021). However, a survey carried out using the Brand24 media monitoring tool pointed to exponential growth in the number of mentions of the word 'CoronaVac' in the media, after President Jair Bolsonaro's speeches, with 85.7% of these mentions having a negative connotation.[1]

It was in this context of disinformation and public devaluation of the Sinovac vaccine on social media that, on January 17, 2021, when Brazil recorded a daily rate of 964 deaths per day, CoronaVac became the first vaccine against covid-19 to be administered in Brazil. The vaccine was given to nurse Monica Calazans, 54, who works at Hospital das Clínicas in São Paulo and was classified as high-risk. Vaccination of the first Brazilian woman occurred hours after authorization for emergency use was issued by Anvisa and was broadcast live at a press conference, marking a political victory for the governor of São Paulo. On his social networks, João Doria published: "I have determined that as soon as Anvisa approves the emergency use of the Butantan vaccine, the Butantan Institute will immediately deliver the vaccines to the Ministry of Health so that they can be distributed to SP, DF and [to] all the Brazilian states. Brazil is in a hurry to save lives." (CORREIO DO POVO, 2021). The following day, President Jair Bolsonaro, meeting with his supporters in front of the official residence of the Palácio da Alvorada, declared: "The vaccine is Brazil's, it does not belong to any governor, no. It's Brazil's" (G1, 2021).

As vaccination in Brazil began, the debate about CoronaVac on social networks was reignited, once again highlighting that political use of disinformation influences public opinion and collective health. Considering all the issues pointed out here and given the relevance of their developments, this research study proposes the analysis of speeches given by the president of the republic in relation to the CoronaVac vaccine against covid-19, during the pandemic in Brazil, in view of the classification of informational disorders.

METHODOLOGICAL PROCEDURES

In the field of social sciences, the qualitative approach is concerned with aspects of social processes and phenomena that cannot be completely captured, and reduced to operations with variables (MINAYO, 2001, p. 22), whereas descriptive exploratory research seeks to foster familiarity and describe the characteristics of a given phenomenon in view of the studied problem (GIL, 1991, p. 45). In this work, to cover the topic

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1   Data was obtained by the authors through monitoring the Brand24 platform, from October 11 to November 10, 2020. It is a Polish startup that allows search and monitoring through terms. This period was selected to establish a comparative analytical perspective of one month, observing information behavior on social networks starting from ten days before the cancellation of the purchase of 46 million doses of CoronaVac.

investigated more comprehensively, results and data obtained were discussed based on Bardin's (2009) content analysis methodology.

Content analysis is an investigative technique that uses a set of analysis tools and systematic procedures that allow "the inference of knowledge regarding the conditions of production/reception (inferred variables) of these messages" (BARDIN, 2009, p. 44, own translation). The analysis process followed these steps: a) selecting statements; b) pre-analysis; c) categorizing elements of information disorders as follows: motivation, intended audience, accuracy, classification, and type in the ecosystem; d) classification of information disorders as follows: disinformation, misinformation and mal-information; and e) discussion of the analysis.

The period from March 14, 2020, to January 17, 2021, was chosen i.e. between the date identified as the beginning of the covid-19 pandemic in Brazil and the day in which the first application of the vaccine against the disease was carried out. Public speeches made by President Jair Bolsonaro on vaccines in this period which had the greatest impact were selected. The president's statements were collected through a thorough search in the largest online search engines - Google, Bing and Yahoo -, using various combinations of search terms: "vaccine", "covid-19", "coronavirus", "Jair Bolsonaro", "Bolsonaro", "president", "president of Brazil". The viewpoints were pre-analyzed and organized into spreadsheets identifying the date, context, and content. For analysis of the material, the following categories were established: motivation, intended audience, accuracy, classification, and type in the ecosystem. They were based on questions raised by Claire Wardle and Hossein Derakhshan (2017) in relation to the elements of informational disorders and their classifications.

When classifying the categories of information disorders, Claire Wardle and Hossein Derakhshan (2017) use the following definitions:

> Disinformation: false information, deliberately created to harm a person, a social group, an organization or a country; Misinformation: incorrect information, but that was not created with the intention of causing harm; Mal-information: information based on reality, used to cause harm to a person, an organization or a country (ours).

Regarding the elements of information disorders, Wardle and Derakhshan (2017) establish three macro categories with questions that investigate the information content:

1. The agents: who are they and what are their motivations?

2. The messages: what is their format?

3. The interpreters: how do they understand the messages?

In the information disorders ecosystem, Wardle and Derakhshan (2017) further establish a subdivision for these three categories in relation to typology, with eight possible classifications. Their classifications overlap in terms of false and harmful characteristics of information.
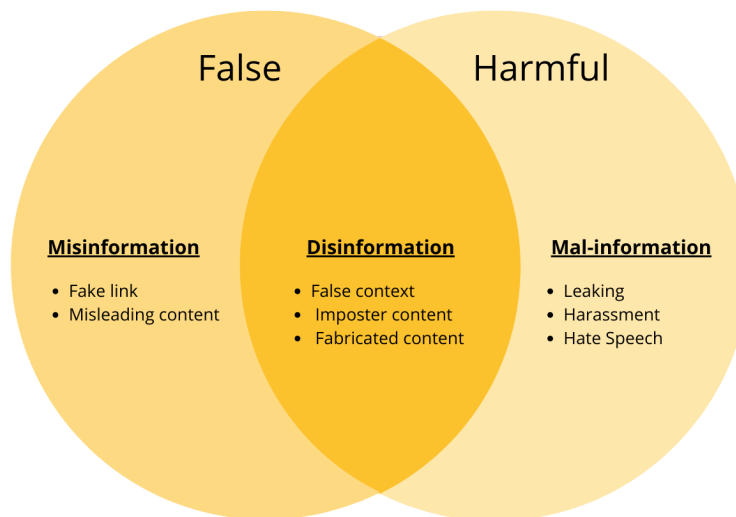
Figure 1 – Ecosystem of information disorders: intersections between misinformation, disinformation and mal-information
Source: Adapted from Wardle and Derakhshan (2017, p. 20).

Based on this theoretical framework, the macro categories 'agent' and 'message' were selected for analysis, to which a third category was added to identify informational disorders, created with the aim of facilitating the understanding of the classifications and applied typologies. The macro category 'interpreter' was not included in the analysis as this would have gone beyond the main objectives of the work. Regarding the typologies, it is important to point out that, although they were primarily developed for the analysis of news in the digital environment, these categories were adapted for the classification of content in the statements observed here.

Content analysis

Among all the materials collected, the ten main speeches by President Jair Bolsonaro on vaccines were chosen, opting for those with the greatest impact and those which mentioned immunizing agents directly. The statements were made in different contexts and on different platforms, as described below:

Speech 1
Date: 07/30/2020.
Context: Weekly speech by the President of the Republic, live, on his personal YouTube channel – Live of the week (BOLSONARO, 2020c).
Content: "A lot is said about the covid-19 vaccine. We joined that consortium over in Oxford. There is every indication it will work, and 100 million units will arrive for us. It's not from that other country, okay, guys? It's from Oxford there."

Speech 2
Date: 08/06/2020.
Context: Signing ceremony of provisional measure no. 994/2020 releasing BRL 1.9 billion for the acquisition of the Oxford vaccine (EBC, 2020a).
"What is most important about this (Oxford) vaccine, unlike the other one that a governor decided to agree with another country: the technology comes to us. And together with the means we have, we can really say that we did everything possible and impossible to save lives, unlike those who have insisted on remaining in opposition since 2018, that say the opposite."

Speech 3

Date 10/21/2020

Context: Press conference after the Ministry of Health announced its intention to purchase 46 million doses of CoronaVac in partnership with the Butantan Institute (EBC, 2020b).

Content: *"There was a distortion on the part of João Doria regarding what he said. He has a protocol of intentions; I've already asked him to cancel if he [Pazuello] signed. I have already ordered the cancellation. I am the president; I do not relinquish my authority. Especially because I would be buying a vaccine that nobody is interested in, except us. [...] you cannot inhale something in a person and the harm is greater than the possible benefit. [...] We are perfectly aligned with the Ministry of Health, working to find a reliable vaccine. Nothing more than that. [...] Any and all vaccines are ruled out. It must be validated by the Ministry of Health and has to have certification from Anvisa as well. Other than that, there is no spending of resources, particularly a large one like this, right? What would it be for us to vaccinate 100 million people approximately, 10 dollars per vaccine, that would be... I didn't do the math... it's quite an absurd amount, even more so because, I repeat, we don't have scientific proof."*

Speech 4

Date: 10/21/2020

Context: Interview granted to Jovem Pan radio, to the program Os Pingos nos Is (OS PINGOS NOS IS, 2020).

Content: *"We will not buy from China, it is my decision I do not believe that it provides enough reassurance to the population, due to its origin. This is our thinking. I'm sure that other vaccines are being studied and could be scientifically proven, I don't know when, because moreover this could last for years. And we are also working, Butantan to get the vaccine. [...]. The Chinese [vaccine], unfortunately, there is already significant mistrust among the population, not least because, as many say, this virus was born there."*

Speech 5

Date: 10/29/2020.

Context: Weekly speech by the President of the Republic, live, on his personal YouTube channel – Live of the week (BOLSONARO, 2020).

Content: *"The vaccine that took the shortest time to enter in... to be made available to the population took four years. And we don't even have the vaccine yet. No one is going to take your vaccine by force, okay? Look for another one. And I, who am the government, it's not my money, it's the people's, won't buy the vaccine either, okay? Find someone else to pay for your vaccine over there."*

Speech 6

Date: 11/10/2020.

Context: Message posted on President Jair Bolsonaro's personal account on the social network Twitter (GULLINO, 2020).[2]

Content: *"Death, disability, anomalies. This is the vaccine that Doria wanted to force all the people from São Paulo to take. The president said the vaccine could never be mandatory. One more win for Jair Bolsonaro".*

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2   Report with image of the tweet, which is no longer available on the president's social network (GULLINO, 2020).

Speech 7

Date: 12/17/2020.

Context: Speech during the signing of provisional measures to support the productive sector in Porto Seguro - BA (EBC, 2020c).

Content: "I will not take [the vaccine]. *Some say I'm setting a terrible example. Oh, imbecile! Oh, idiot, who is saying that I'm a bad example, I already had the virus, I already have antibodies, why take the vaccine again? And another thing that has to be made very clear here. At Pfizer it is very clear in the contract: 'we are not responsible for any side effects'. If you turn into an alligator, that's your problem. I'm not going to mention another animal here, so I don't talk nonsense. If you become superman, if a woman grows a beard or a man starts talking with a thin voice, they have nothing to do with it. What's worse, messing with people's immune systems."*

Speech 8

Date: 12/24/2020.

Context: Weekly speech by the President of the Republic, live, on his personal YouTube channel – Live of the week (BOLSONARO, 2020b).[3]

Content: *"The effectiveness of that vaccine in São Paulo seems to be really low, right? I will not disclose the percentage here, because if I am 0.001% out, I will take a beating in the media, but it seems that the percentage is down there taking the other into account."*

Speech 9

Date: 01/13/2021.

Context: Public speech by the president in conversation with his supporters in the garden of the Palácio da Alvorada (BOLSONARO..., 2021).

Content: *"This 50% one is a good one? The beating I got because of it. Now they are seeing the truth. I've been getting a beating for four months because of the vaccine. Between me and the vaccine there is Anvisa. I am not irresponsible. I'm not out to please anyone."*

Speech 10

Date: 01/15/2021.

Context: Interview granted to Jovem Pan radio, to the program Os Pingos nos Is (OS PINGOS NOS IS, 2021).

Content: *"Let's go, the vaccine is called e-mer-gen-ci-al. It has not been properly proven yet. The labs and their contracts say they are not responsible for side effects. Ok? I have also said: As far as I am concerned, the vaccine will not be mandatory, it will be voluntary. And I have also said: the vaccine that may be certified by Anvisa will be acquired by us, but the measure is provisional for now, for just a few days, right? This year. Yeah... there's the authorization for the health department to buy vaccines around the world and only pay for them after going through Anvisa's screening. We are doing our part in this regard. I've already been infected. I already have antibodies. Why get vaccinated? Now what I want to do. Anyone who wants to take the vaccine, I repeat, will take it. It will be available, with knowledge of the possible side effects where the laboratories are responsible. So, I am not campaigning against the vaccine."*

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3   The content was removed from YouTube for violating guidelines, but the video of the speeches is available on Facebook.

RESULTS AND DISCUSSIONS

When considering the speeches highlighted, the predominance of the use of personal social networks and interviews for the dissemination of President Jair Bolsonaro's stances on vaccines against covid-19 is seen, as shown in Figure 2.
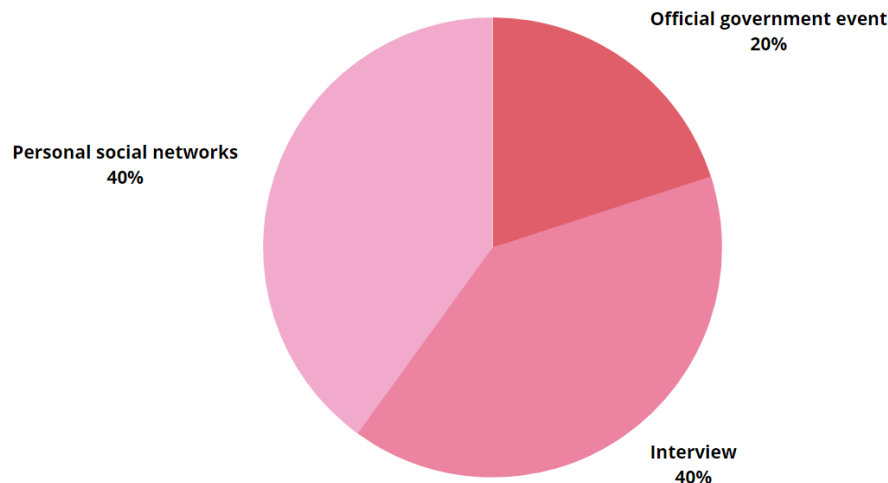

Figure 2 – Platforms used by President Jair Bolsonaro in his speeches with the greatest impact on vaccination against covid-19, from March/2020 to January/2021
Source: Developed by the authors.

It is important to highlight the prominence of digital platforms in the distribution and reach of these positions, because even when the president's speeches were not directly aimed at this medium, such as in official government events, it was through web media that they gained further impact and visibility.

When considering the categories and classification of content in the president's speeches about the vaccine, considering the elements and categories of informational disorders, the following division is observed:

Table 1 – Statements by President Jair Bolsonaro on the vaccine(s) against covid-19

Speech	Agent		Message	Information disorders	
	Motivation	Intended audience	Accuracy	Classification	Type in the ecosystem
1	Policy	Social groups	Not identified	Mal-information	Not identified
2	Policy	Whole society	Manipulated	Misinformation	Fake link
3	Policy	Whole society	Manipulated and misleading	Misinformation Disinformation	Misleading content Fabricated content
4	Policy and social	Whole society	Misleading	Misinformation Disinformation Mal-information	False context Misleading content Hate speech
5	Policy	Social groups	Manipulated	Disinformation Misinformation	False context Fake link
6	Policy	Social groups	Misleading	Disinformation	False context Fabricated content
7	Policy and psychology	Whole society	Misleading and fabricated	Misinformation Disinformation Mal-information	Misleading content Fabricated content Harassment
8	Policy	Social groups	Manipulated	Misinformation	Fake link
9	Policy	Social groups	Misleading	Misinformation	Misleading content
10	Policy	Whole society	Misleading and manipulated	Misinformation Disinformation	Fake link Misleading content Fabricated content

Source: Developed by the authors.

The speeches were categorized in line with the types in the informational disorder ecosystem. The categories were established from the analysis of the dominant characteristics in the speeches and from the verification of the declared information.

In Speech 1, the first speech analyzed, no clearly perceptible informational disorders were identified. When Speech 2 was given by President Jair Bolsonaro, there was no evidence or information regarding the impossibility of transferring technology for the CoronaVac vaccine – on the contrary, a probable partnership was expected in this regard, which in fact occurred on September 30, 2020, when the government of São Paulo signed a contract between the Butantan Institute and Sinovac Life Sciences for the transfer of vaccine technology.

In Speech 3, the president accused Governor João Doria of having distorted information about the purchase of vaccines by the Ministry of Health, but this is a manipulation of information by the president, as the signed purchase intention protocol was a preliminary execution instrument signed between two bodies, and showed the Ministry of Health's interest in acquiring the vaccines that would be produced by the Butantan Institute. The protocol was canceled by order of the president, as per his statement, but by September 2021, the federal government had contracted and received more than 100 million CoronaVac vaccines produced by Butantan. This is misleading and also fabricated content, since there was no evidence or proof that the vaccines under development would cause greater harm than possible benefit.

In Speech 4, there is evidence of false context. Accusations with a focus against China and Chinese products suggest possible social motivations, that is, intended social disruption regarding the issues presented and also reasoning based on an affiliation with social groups of similar opinions, especially in the context of the pandemic, and accusations against the country regarding the virus. It is also possible to perceive characteristics of misleading content, as there was no evidence that the vaccine being developed by China lacked credibility among the population at the time. There is also the potential premise of hate speech and false claims about the origin of the virus, which, despite being initially identified in China, has not been

proven to have originated in the country. The speech is filled with prejudice and hate speech (xenophobia) when associating the origins of the pandemic with China.

In Speech 5, it is possible to identify characteristics of false context and fake links. The information is partially true, as the vaccine with the fastest development up to the time of the statement (against mumps) had actually taken 4 years to be ready. However, the information is used in a false context with the intention of invalidating or calling into question the effectiveness of vaccines against covid-19, whose development took less time. This statement is not true. Although he is the president of the republic, this is not a decision that is taken exclusively by the Executive. State coffers receive redistributed resources from the Union to complement their tax collections, so that the entire process of acquiring the CoronaVac vaccine and other immunizing agents, even with resources from the state of São Paulo, was indirectly linked to the federal government.

Speech 6 displays the characteristics of false context, as it takes an inductive approach to presenting the information that one of the participants of the study on the effectiveness of vaccines died during the testing phase, although his death has nothing to do with the vaccine. It also presents fabricated content since the claim that the vaccine causes anomalies and disability is false.

In Speech 7, characteristics of disinformation related to misleading content, fabricated content and harassment are observed. The use of metaphors and fanciful allusions about the effects of the vaccine points to psychological motivations both in the handling of information and in the search for prestige by presenting a narrative of resistance and no need for the vaccine against covid-19. It has been scientifically proven that antibodies against SARS-CoV-2 do not guarantee immunity against the disease or make the vaccine expendable. The speech about vaccine side effects was probably presented as a satirical resource or hyperbole, but the potential impact of the relevance of a head of state's discourse should be considered. The side effects of the vaccine clearly do not include the transformation of people into alligators, the beginning or growth of a beard in women or even changes in the male voice. Continuing our analysis of the seventh speech, when Bolsonaro calls opponents/those that question him "idiot" and "imbecile" we perceive this as a harassing stance, understood to be a type of offensive behavior. This statement points to a harmful and harassing information disorder.

In Speech 8, it is possible to identify characteristics of a fake link in the manipulation of information about the efficiency of immunizing agents. Although research on other immunizing agents showed superior efficacy in relation to CoronaVac, the information that the vaccine's effectiveness in percentage terms would be "down there" is false – on the contrary, its effects in combating the pandemic were evidenced by the drop in infection and death rates in the following months.

Speech 9 signals the use of misleading content by presenting genuine information about the overall effectiveness of the vaccine (50.38%) to frame the issue and associate it with "irresponsible" conduct.

Speech 10 has the characteristics of a fake link, misleading content, and fabricated content. The information on the exemption from responsibilities demanded by the laboratories is true but used in a fake link to question the safety of the vaccines, which was proven through various tests and requirements by Anvisa for the authorization of their application. Antibodies created by SARS-CoV-2 infection do not guarantee immunity against the disease or make the vaccine expendable. His statement that he is not "campaigning against the vaccine", when his previous positions show, for the most part, a declared opposition, and several attempts to discredit the vaccine can be classified as fabricated information.

Perceptions and interpretations

The analysis carried out points to the predominance of political motivation in the president's statements regarding vaccines against covid-19, with only one example of possible social and psychological motivations.

Regarding the intended audience, it is observed that, in the selected speeches, 50% of the president's statements were aimed at society as a whole and 50%, at specific social groups, mainly characterized by his supporters. This inference is based on the chosen communication platforms used. Although all of them are accessible to the whole of society, it can be deduced that priority is given to the president's supporters on occasions when he chose to speak on his personal social networks - his YouTube channel and Twitter profile – and in conversations with followers in front of the Palácio da Alvorada.

As for the accuracy of the messages being spread, predominantly there is misleading and manipulated information. There is a common characteristic of partial truthfulness, whose decontextualized, selective or mistaken use is made with the intention of framing an issue, thus deceiving or confusing. Fabricated information, which appears to a lesser extent, is entirely false, lacking any support compatible with reality. It is also used to deceive or harm.

Regarding the spectrum of informational disorders, there is a predominance of misinformation followed by disinformation, especially in relation to the CoronaVac immunizing agent. Misinformation is characterized by the use of data, ideas or facts that do not faithfully correspond to the truth, but without a clearly evident intention to harm. On the other hand, disinformation is shared with the intention of causing harm to a person, organization, group, or country, among others. Among the statements observed, it is evident that the predominant focuses of the analyzed information disorders are: João Doria, then governor of São Paulo and political opponent of President Jair Bolsonaro, the CoronaVac vaccine from the Chinese laboratory Sinovac, and China.

The information disorder identified to a lesser extent in the ten statements analyzed was mal-information, characterized by the use of completely true and genuine information used with the intention of harming something or someone. This can be seen in Figure 3.
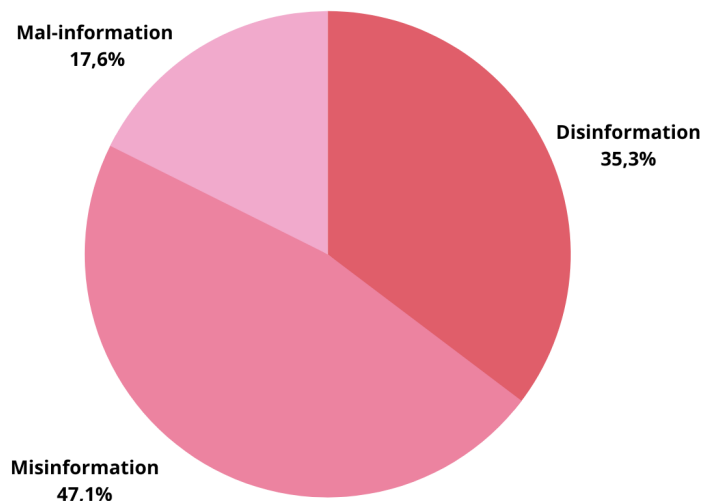

Figure 3 – Statements by types of informational disorders
Source: Developed by the authors.

In an analysis of the mortality rates of covid-19 during the period when the information disorders took place, it was observed that the statements made during times with the worst mortality rates tended to use misinformation regarding the vaccine, while disinformation was the disorder most present in the context of lower mortality rates. This trend is shown in Figure 4:
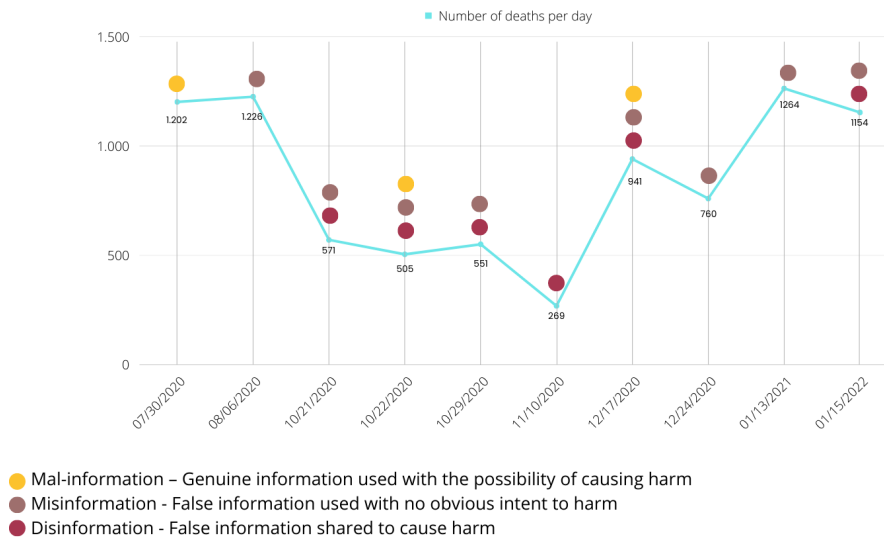
Figure 4 – Average number of deaths per day and information disorders identified on the days when President Jair Bolsonaro issued statements about the vaccine against covid-19
Source: Developed by the authors, based on Brazil (2022).

Through the analysis carried out, the recurrent use of information disorders in President Jair Bolsonaro's speeches about vaccines against covid-19 is evident. In his public speeches, within the context of the first year of the pandemic and the race to develop immunizing agents, the highest representative of the Executive branch in Brazil disseminated disinformation, mal-information, and false information about the effectiveness of vaccines and their importance for collective public health. It is worth stressing Bolsonaro's emphasis, implicitly or explicitly, on the disqualification of the CoronaVac immunizing agent and the repeated use of intimations about its low efficacy and safety and even about the side effects, which ranged from satirical and fanciful possibilities to invalidity and death. Furthermore, the propagation of these erroneous discourses, that is, of these various informational disorders, was related to the origin and association of the immunizing agent with the Chinese.

Turning to the matter of vaccine origin, research about vaccine hesitancy by Galhardi *et al.* (2022, p. 1851) which surveyed Brazilians from classes A, B and C found a significant percentage (57%) with a preference for specific laboratories. Of these participants, 15% said they preferred the Oxford vaccine, from the pharmaceutical company AstraZeneca, while only 6% cited CoronaVac. The authors state that, regarding the dissemination of fake news on digital platforms, "without a doubt, the most vilified immunizing agent was CoronaVac" (2022, p. 1854).

Mistrust generated around CoronaVac was also the subject of a study carried out by Küçükali *et al.* (2022), in which the authors analyzed 551,245 tweets related to the topic. All tweets included in the study were shared by 1000 unique accounts, of which 2.7% were verified and 11.3% were from organizational users. The study pointed out that 90.5% of the tweets were about vaccines, 22.6% (n = 213) of the tweets mentioned at least one name of a vaccine against covid-19, and the most frequently mentioned vaccine was CoronaVac (51.2%). It was most frequently referred to as the "Chinese vaccine" (42.3%). About 22.0% (n = 207) of tweets included at least one anti-vaccination topic. Poor scientific processes (21.7%), conspiracy theories (16.4%) and suspicions about manufacturers (15.5%) were the most cited themes. Among the themes that occurred concomitantly were: "poor scientific process" accompanied by "suspicion in relation to manufacturers" (n = 9) and "suspicion in relation to health authorities" (n = 5).

The lack of interest among President Jair Bolsonaro's government in supporting decisions based on science, normalizes disinformation, fosters a climate of mistrust about the development of a vaccine against

covid-19 and, concomitantly, mitigates people's confidence in the National Program of Immunizations – considered one of the most comprehensive in the world (SOUTO; KABAD, 2020).

The environment of uncertainty caused by the disinformation crisis discussed above fosters the discrediting of science at pace. As a result, this type of discourse imminently stimulates conspiracy theories on the most varied of topics, with a focus on the anti-vaccine movement. This may have been reflected in the number of deaths from the disease, with Brazil being the country with the second highest number of deaths in the world reaching 526,892 thousand deaths by July 7, 2021 (BRASIL, 2022).

Massarani et al. (2021) underpin the idea that vaccine hesitancy occurs because of the disinformation crisis and impacts the mistaken way in which the population perceives vaccination.

According to the WHO (SAGE WORKING GROUP ON VACCINE HESITANCY, 2014), vaccine hesitancy is a global problem, more frequently found in relation to new and newly introduced vaccines. Ineffective and inefficient communication is one of the factors behind vaccine hesitancy. Misleading speeches, inflated by the practice of astroturfing[4] and political motivations, can encourage hesitation.

Couto, Barbieri and Matos (2021) highlight the issue of disinformation and the individual versus society relationship by pointing out that collective immunity only occurs when most of the population is immunized. It is a battle fought in the political and social arenas, in which the population is at the mercy of individual interests, supplanted by disinformation and political interests.

Individual objection to vaccines offered by public health systems has been reported since 1798, when the first vaccine appeared. In Brazil, the 1904 Vaccine Revolt represents a milestone in the opposition to vaccination and reflects the importance of communicating health actions in the face of conspiracy theories (MILER-DA-SILVA; GARRIDO, 2021).

The influence of informational disorders on vaccine hesitancy is also observed in the association made by researcher Andrew Wakefield et al. (1998), in a publication in The Lancet, relating the vaccine against measles, mumps and rubella (MMR) to the development of autism. Although Wakefield's research was based on a small sample, the publication resulted in a drop in vaccination numbers in the United States (DESTEFANO; CHEN, 1999), and, even after being refuted, the study continues to be used to pass on disinformation (VASCONCELLOS-SILVA; CASTIEL; GRIEP, 2015).

In Brazil, even though it is a relatively small number, the growth of the anti-vaccination movement can be highlighted and correlated with the return of almost eradicated diseases, such as measles and yellow fever, which registered significant rates in the years 2011 and 2017, respectively (MILER-DA-SILVA; GARRIDO, 2021). It is possible to identify a new revolt, in the context of the covid-19 pandemic, which manifests itself from the perspective of the digital age, characterized by mass propagation of disinformation and the influence of the position taken by representatives of public authorities.

FINAL CONSIDERATIONS

The infodemic, when considered in the context of the covid-19 pandemic, was characterized by the high quantity of information available to the detriment of its quality. In Brazil, this situation was exacerbated by the propagation of misinformative content by public figures from political and governmental bodies.

The statements made by the president of the republic, Jair Bolsonaro, contributed to feelings of mistrust and collective vaccine hesitation attitudes, mainly in relation to CoronaVac. This can be seen through discussions and mobilizations on social networks such as Twitter and the declared rejection of immunization.

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4   According to Silva (2015), astroturfing is a practice framed by several ethical ambiguities, something that works hard to deceive people, make them believe in false aspects of a reality and thus hide private interests.

When reflecting on the ideas proposed in this work, vaccine hesitancy was particularly due to the propagation of speeches with misinformative content by figures either representing or part of political-governmental power. The ubiquity of information on covid-19 also fostered the spread of disinformation, giving space to the circulation of all kinds of information, mal-information, disinformation and fake news, among others. Within this context the bubbles in which individuals are inserted can become an aggravating factor.

Making use of his authority as president of the republic, Jair Bolsonaro used wide-ranging media and even official speeches to encourage anti-vaccination sentiment among the population. He discredited the press that published news that contradicted what he was saying and, resorting to unfounded arguments based on political and personal ideologies, fostered vaccine hesitancy among part of the population. This disinformation and political ideas were shared by individuals who were (or even still are) in the same bubble as the country's leader at the time of the pandemic, thus underpinning a movement that could be the advent of a vaccine revolt.

When observing the infodemic and vaccine hesitancy as phenomena that interconnect communication, politics, public opinion and collective health, the importance of continuous studies, monitoring of impacts, as well as the consequences stemming from these phenomena becomes evident. With the covid-19 pandemic and the posture of public figures such as President Jair Bolsonaro, collective vaccine hesitation ceased to be a significant historical fact restricted to the Vaccine Revolt of 1904, serving as evidence of the impacts of disinformational content on opinion, public health, and collective well-being.

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