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Vaccine hesitancy: analysis of posts published in an anti-vaccination group on Facebook®

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ABSTRACT

Objectives: to analyze posts published in an anti-vaccination group on the social network Facebook®. **Methods:** this is an exploratory descriptive study. The *corpus* for analysis consisted of posts made from January to December 2020 in a Facebook® group entitled "Vacinas: O lado obscuro das Vacinas" (Vaccines: The Dark Side of Vaccines). Two independent researchers conducted the analysis. The posts were categorized according to type of material, post, comments, and topic. Descriptive statistics were used to analyze the results. **Results:** the sample consisted of 545 posts, of which 44.9% (n = 370) were categorized as "secondary posts", i.e., they reproduced information from other websites. The majority of posts (n = 344; 63.1%) were shared on the group participants' personal pages. The most frequently discussed topic in posts about vaccines, excluding topics related to the COVID-19 pandemic, was "vaccines cause disease" (n = 117; 12.4%), followed by topics related to questions about the "credibility/veracity of vaccines" (n = 99; 10.5%) and phenomena presented as "adverse reactions" (n = 98; 10.4%). **Conclusions:** analysis of posts revealed a tendency to spread misinformation and question the efficacy and safety of vaccines, propagating news that incites the anti-vaccine movement.

Descriptors: Vaccination Refusal; Child Care; Immunization; Pediatric Nursing.

INTRODUCTION

Brazilian National Immunization Program (In Portuguese, Programa Nacional de Imunização – PNI), internationally recognized as a benchmark, has achieved historic success by successfully eradicating and eliminating some communicable diseases through vaccination. Despite this, in recent years, there has been an alarming decline in vaccination coverage, raising concern among public healthcare professionals and managers about the negative consequences of this phenomenon on the population's health, such as the resurgence of vaccine-preventable diseases that had previously been eradicated, such as measles[1].

Worldwide, measles notifications increased by 300% in the first three months of 2019, compared to the same period in 2018[2]. In Brazil, the most affected state was São Paulo, which accounted for 99% of confirmed cases[3].

The phenomenon of stagnant or declining vaccination rates resulting in outbreaks of vaccine-preventable diseases is not exclusive to Brazil. It represents one of the threats to global health[4] and causes concern in various contexts[5-8].

The decline in vaccination coverage has been attributed primarily to vaccine hesitancy, understood as a delay in accepting or refusing vaccination even when

vaccination services are available[9]. This is a complex phenomenon[10], which varies over time, location, and type of vaccines[1]. It presents a broad spectrum, including both those individuals who accept or delay receiving some vaccines and those who unequivocally refuse all vaccines[1,11].

The World Health Organization (WHO) considers vaccine hesitancy one of the top ten threats to global health, highlighting factors related to personal beliefs, such as safety concerns and skepticism about vaccine efficacy, social media, and exposure to online misinformation[12].

According to The State of the World's Children 2023: For Every Child, Vaccination report, an estimated 67 million children were not routinely immunized, partially or fully, between 2019 and 2021, which 48 million not receiving any immunization[9,13]. Given the global magnitude of vaccine hesitancy, the WHO created the Strategic Advisory Group of Experts Working Group on Vaccine Hesitancy (SAGE-WG) to understand in greater depth the magnitude of this issue and the factors that influence it, in order to systematically compile evidence that can guide public health interventions[11].

Vaccine hesitancy is a phenomenon in which several sociocultural and individual aspects influence the population's behavior, such as social norms, historical aspects, geographical, political, socioeconomic, cultural, religious, gender aspects, previous experiences, influence of leaders, and perception and skepticism about the pharmaceutical industry, which are linked to trust in the system and healthcare institutions/professionals[11,14-18]. In this context, understanding the decision-making process by parents is particularly relevant to better understand the phenomenon and, therefore, propose interventions[18,19].

In this context, the strengthening of social media as channels for the indiscriminate dissemination of information, with high accessibility and two-way communication[20], combined with the strong presence of groups opposed to vaccination in these media[20], are important elements for understanding the phenomenon of hesitancy and reduction in vaccination rates[11,21], since parents may be members of these groups or spread misinformation to other parents regarding vaccination.

The appropriate fight against the growth of anti-vaccine movements involves the dissemination of accurate and correct information about immunobiological agents and the severity of vaccine-preventable diseases. This implies creating spaces for expanding knowledge about this topic, as well as improving professional training so that the team has the foundation to guide families in the decision-making process regarding immunization[21-23].

A report by the European Centre for Disease Prevention and Control published in 2020 showed that between 4% and 62% of different populations assessed in several countries use social media as a source of information about vaccines, especially the Facebook® network (2025, Meta Platforms, United States), highlighting the monitoring of networks as a new area of research methodology, which can contribute to understanding how information about vaccines is shared[24].

Unlike Europe and the United States, and despite growing concern about the issue globally, in Brazil, literature on vaccine refusal and "anti-vaccine" groups is still scarce. While vaccine hesitancy is not considered a new phenomenon, the spread of vaccine misinformation through social media has created a new problem, particularly due to its widespread reach. In contrast to traditional media, social media allows individuals to rapidly create and share content without editorial oversight, contributing to ideological isolation. Thus, considerable public health concerns arise from the dissemination of anti-vaccination messages on such platforms and the resulting potential for hesitancy, including the undermining of public trust in the development of future vaccines[18,25,26].

Considering the influence of anti-vaccination groups on social media in the spread and worsening of vaccine hesitancy, the role of social media as a source of collective information and a space for connections among peers, the widespread dissemination of fake news, the influence of sociocultural and political aspects on the decision to be vaccinated, and the need to strengthen the population's knowledge, this research was developed with the aim of analyzing posts published in an Brazilian anti-vaccination group on Facebook®.

METHODS

This is a descriptive and exploratory study conducted from February 2021 to April 2022 based on publications available on a Facebook® page entitled "*Vacinas: O lado obscuro das Vacinas*" (Vaccines: The Dark Side of Vaccines), which had over 14,000 members at that time. Facebook® was chosen because it is one of the largest virtual social networks in the world, with a large number of active users[18,25].

We examined 603 posts available from January to December 2020, a period that coincided with the onset of the COVID-19 pandemic and a resurgence of discussions about the disease and the development of vaccines to combat it. Posts available in full were included, and posts with partially available or duplicate content were excluded. Posts that had been removed or deleted by the group administrator and were unavailable during data collection were recorded as losses, totaling 53 (9.6%) posts. Thus, the *corpus* of analysis consisted of 545 posts.

In September 2020, one of the researchers began observing the group's dynamics through participation as a member of the Facebook® page "*Vacinas: O lado obscuro das Vacinas*" (Vaccines: The Dark Side of Vaccines. Data from posts between January and December 2020 were collected using a tool specifically designed for the study, based on the literature on the topic[12,27,28]. The instrument included two sections: the first was composed of variables characterizing the person responsible for the publication (sex and category of the group participant), which presented dichotomous or multiple-choice responses with a single answer; and the second was composed of variables characterizing the posts (type of material, type of post, thematic category, number of reactions, number

of shares, number of comments, types of comments, types of reactions), whose response categories were multiple-choice and multiple response options.

Table 1 presents variables related to type of material, post, topic, and comments, with their respective response categories. Data regarding the number of shares and reactions to the posts were also collected.

Table 1 - Categorization of variables according to type of material, post, thematic category, comment, and reaction, Brazil, 2022

Variables	Categorization
Type of material	Text, image, video.
Type of post	Original (content authored by the person responsible for the post), secondary (reproduction of information from other sites), replication, questions, comments.
Topic	Vaccination schedule Sharing scientific articles about vaccines Sharing content about vaccines Vaccine components Conspiracy Credibility/veracity Cost/investment in vaccines Vaccine availability Questions/requests for information Vaccine hesitancy among professionals Financial interest News about vaccine research Other topics: not related to vaccines* Other topics related to vaccines** Other topics: related to COVID-19*** Adverse reactions Religion and vaccines Vaccine as an experiment Vaccines cause diseases Vaccines cause deaths Violation of freedom
Type of comment	Original (content authored by the person responsible for the post or comment), secondary (reproduction of information from other sites), duplicate, questions, feedback (specific comments, phrases of approval and support for what was published, emoji, figures, responses to other comments).
Type of reaction	"Like", "Love", "Haha", "Wow", "Sad", "Grr".

Note: *Examples: promotion of an event on longevity; News about the pharmaceutical industry; **Examples: tetanus vaccination during pregnancy; vaccination records; ***Examples: use of masks during the pandemic; death from COVID-19.

For the type of post, the following definitions were considered:

a) original: content authored by the person responsible for the post;
b) secondary: reproduction of information from other sites (news, images, videos and scientific articles);
c) replication: sharing of content previously posted (by one of the members or by the administrator) in the group.

The definition and naming of the response categories of the "thematic" variable were based on other research on the topic[7-20,21].

The content of all posts was analyzed independently by two researchers. They read and interpreted all texts and viewed all images, classifying them into predefined categories, as described above. However, during this process, topics that had not yet been covered were identified and added. In the event of disagreement or doubt, a third researcher was consulted.

The data were recorded in a Microsoft Excel® spreadsheet (version 365, 2019, Microsoft Corporation, United States) and analyzed using descriptive statistics techniques (absolute and relative frequencies).

Ethical aspects

The project was approved by the Research Ethics Committee of the academic institution to which the researchers are linked, under Certificate of Presentation of Ethical Consideration (In Portuguese, Certificado de Apresentação para Apreciação Ética – CAAE) 35463220.0.0000.5505.

RESULTS

In 2020, most of the 545 posts in the "*Vacinas: O lado obscuro das Vacinas*" (Vaccines: The Dark Side of Vaccines) group on Facebook® were published by women (n = 482; 88.4%) and group administrators (n = 392; 71.9%) (Table 2).

Most posts were secondary (370; 44.9%) and text-based (n = 495; 59.9%). The "like" reaction was the most frequent (14,805; 71.6%). Most had up to ten comments (n = 301; 61.4%), especially feedback (n = 420; 40.7%). More than half of the posts (n = 344; 63.1%) were shared on group participants' personal pages, and the majority (n = 157; 45.6%) were shared up to ten times (Table 2).

Regarding the topics of the posted content, most posts referenced the COVID-19 pandemic (n = 146; 15.5%), despite it not being the page's topic of interest. In relation to posts about vaccines, they addressed one or more topics, with the most prevalent being "vaccines cause disease" (n = 117; 12.4%), "credibility/veracity" of vaccines (n = 99; 10.5%), and "adverse reactions" (n = 98; 10.4%) (Table 3).

As for the impact of the posts according to the topics, as shown in Table 4, the 545 posts generated 36,307 reactions (some publications had different combinations of reactions), 12,034 comments, and 12,650 shares. The posts that generated the highest number of reactions belonged to the following topics: "other topics related to COVID-19" (n = 5,779; 15.9%), followed by "credibility/veracity" (n = 4,606; 12.7%) and "adverse reactions" (n = 3,549; 9.8%).

The highest number of comments was also made on posts whose topics focused on "other topics related to COVID-19" (2,511; 20.9%), followed by the topics "vaccines cause diseases" (1,275; 10.6%) and "adverse reactions" (1,256; 10.4%). The posts with the highest number of shares were those that addressed "other topics related to COVID-19" (1,918; 15.2%), "credibility/veracity" (1,588; 12.6%), "vaccines cause diseases" (1,435; 11.4%), and "adverse reactions" (1,446; 11.4%) (Table 4).

Table 2 - Characterization of posts in anti-vaccination groups, Brazil, 2020

Variables	n	%
Sex (n = 545)		
Female	482	88.4
Male	61	11.2
Unidentified	2	0.3
Published by (n = 545)		
Administrator	392	71.9
Member	153	28.0
Type of post (n = 823*)		
Secondary	370	44.9
Replication	164	19.9
Comments	116	14.0
Original	108	13.1
Questions	65	7.9
Type of material (n = 826*)		
Text	495	59.9
Image	260	31.4
Video	71	8.5
Type of reaction (n = 20,675*)		
Like	14.805	71.6
Sad	1.924	9.3
Haha	1.477	7.1
Grr	985	4.7
Wow	876	4.2
Loved it	608	2.9
Comments (n = 490**)		
≤ 10	301	61.4
11 to 20	85	17.3
21 to 30	40	8.1
31 to 40	24	4.9
41 to 50	16	3.2
> 50	24	4.9
Type of comment (n = 1,030*)		
Feedback	420	40.7
Secondary	261	25.3
Questions	234	22.7
Original	48	4.6
Sharing (n = 344**)		
≤ 10	157	45.6
11 to 20	91	26.4
21 to 30	41	11.9
31 to 40	16	4.6
41 to 50	8	2.3
> 50	31	9.0

Note: *"Type of post", "Type of material", and "Type of comment" may include more than one response category; **Some posts did not have "comments" or "shares".

Table 3 - Description of the topics of posts made in a group against vaccination (n = 939*). Brazil, 2020

Topics	n	%
Other topics related to COVID-19	146	15.5
Vaccines cause disease	117	12.4
Credibility/veracity	99	10.5
Adverse reactions	98	10.4
Other topics not related to vaccines	66	7.0
Violation of freedom	64	6.8
Vaccine as an experiment	60	6.3
Vaccines cause deaths	57	6.0
Other topics related to vaccines	50	5.3
Vaccine components	42	4.4
Financial interest	38	4.0
Conspiracy	24	2.5
Sharing content about vaccines	15	1.6
Vaccine hesitancy among professionals	11	1.1
Religion and vaccines	11	1.1
Sharing scientific articles about vaccines	9	0.9
News about vaccine research	7	0.7
Cost/investment in vaccines	7	0.7
Vaccination schedule	7	0.7
Vaccine availability	6	0.6
Questions/requests for information	5	0.5

Note: *Some posts fit into more than one topic.

DISCUSSION

It is recognized worldwide that social media has become a primary source of anti-vaccination information, promoting socialization among people with similar beliefs and the dissemination of incorrect knowledge, making it essential to understand the characteristics and potential impacts of these information contexts[25,27].

This research presents data on a Brazilian anti-vaccine group on Facebook®, a topic still little explored in the scientific literature in that country. It supports previous studies and incorporates an innovative approach, presenting data on the type of material (text, image, video link), type and source of posts, and examining the interaction and engagement of network users with the information shared on the personal page of the social media platform analyzed.

Taking the total number of publications (n = 545) over a period of one year as a basis, more than one post per day is observed, which is much higher than that found in another study, involving a group on the same social network that also had 14 thousand members; however, it showed only 122 publications over a period of eight months[27].

This demonstrates the high level of mobilization of the members of the group analyzed in this investigation and the potential magnitude of this communication vehicle on the topic, in line with what has

Table 4 - Frequency distribution of reactions, comments, and shares according to thematic categories of posts made in a group against vaccination, Brazil, 2020

Topics	Reactions (n = 36,307)		Comments (n = 12,034)		Shares (n = 12,650)	
	n	%	n	%	n	%
Other topics related to COVID-19	5779	15.9	2511	20.9	1918	15.2
Vaccines cause disease	3979	11	1275	10.6	1435	11.4
Credibility/veracity	4606	12.7	1152	9.6	1588	12.6
Adverse reactions	3549	9.8	1256	10.4	1446	11.4
Other topics not related to vaccines	1977	5.4	459	3.8	474	3.7
Violation of freedom	2954	8.1	1162	9.7	797	6.3
Vaccine as an experiment/fake news	2712	7.5	683	5.7	1018	8.0
Vaccines cause deaths	2060	5.7	664	5.5	800	6.3
Other topics related to vaccines	1989	5.5	767	6.4	470	3.7
Vaccine components	1924	5.3	592	4.9	826	6.5
Financial interest	1326	3.7	333	2.8	626	4.9
Conspiracy	1064	2.9	326	2.7	416	3.3
Sharing content about vaccines	456	1.3	122	1.0	170	1.3
Vaccine hesitancy among professionals	232	0.6	24	0.2	180	1.4
Religion and vaccines	531	1.5	172	1.4	99	0.8
Sharing scientific articles about vaccines	186	0.5	87	0.7	45	0.4
News about vaccine research	225	0.6	64	0.5	92	0.7
Cost/investment in vaccines	283	0.8	69	0.6	122	1.0
Vaccine schedule	219	0.6	64	0.5	92	0.7
Vaccine availability	153	0.4	103	0.9	36	0.3
Questions/requests for information	103	0.3	122	1.0	15	0.1

already been identified in the literature on the growing role of social media in the spread of false information about vaccination[27].

The predominance of women in the analyzed group may be related to the trend observed in studies that demonstrate greater female involvement in discussions about vaccination on social networks[29,30]. Mothers turn to social media out of frustration with healthcare professionals, exposing themselves to false content and increasing hesitation[30]. Women have lower vaccination intentions compared to men[31].

In Brazil, at the time this study began, there was another anti-vaccine group on Facebook® called "*Sou Contra a Vacina HPV*" (I am against the HPV vaccine), which had 5,860 members in early 2019 and was one of the first in the country to discuss vaccines on the social network. However, this group only addressed topics related to the HPV vaccine.

A study conducted in Portugal analyzed, from April to October 2020, a Facebook® group called "Anti-VAX Portugal", which opposed the COVID-19 vaccine. The group had 347 members and, as a main result, identified 440 posts during the six-month period, of which 48% were related to conspiracy theories[32], which differs from the results found in the present investigation, in which only 2.5% of the topics related to conspiracy theories were found.

The dissemination and influence of Fake News by the anti-vaccine movement in Brazil has been occurring since 2017, when the country lost its measles-free certification from the Pan American Health Organization (PAHO). One of the main factors related to vaccine hesitancy in that context was such groups' dissemination of Fake News[33]. With the advancement of the COVID-19 pandemic in 2020, there was a crisis of confidence in scientific research and the safety of vaccines in general, which were already available to the population before the pandemic[33].

As in the present study, previous national research observed that conducting research in a media environment reiterates the understanding about the expansion of false information about vaccination, supported by data that appears to be structured in scientific arguments, but which does not result from the application of experiments and proven methods[33].

Analysis of the characteristics of 399 countries regarding sources of information about measles and the measles vaccine and their relationship with correct knowledge and measles vaccine administration reveals that the internet and social media represented a significant source of information and were often associated with incorrect knowledge, which is significantly related to vaccine hesitancy[34]. While it is argued that healthcare professionals are aware of this behavior and respond accordingly on these platforms, with

the help of social media experts[34], this strategy may have limited applicability in explicitly anti-vaccine groups. To participate in a Facebook® group, an individual must be accepted, and their profile or comment can be deleted at any time by the administrator, hindering or preventing healthcare professionals from providing educational support within anti-vaccine groups.

The results of this investigation indicate that a large part of the content published was of the secondary type, i.e., it contained reproductions of information from other sites, such as conventional news sites, video links, and scientific articles.

A study conducted during the COVID-19 pandemic ranked the top ten URLs (virtual addresses of a page or website) mentioned. Pro-vaccine profiles shared most of the content from mainstream news sites, medical sites, or technology/science sites and social media, while anti-vaccine profiles shared more content from YouTube®, social media sites, and various sites specializing in alternative health products, pseudoscience, and conspiracy theories[20].

This study also observed significant sharing of materials with non-scientific content and sensationalist information published on mainstream news sites. It was also observed that reproductions of scientific article content were accompanied by text written by the page administrator, questioning the veracity of the scientific publications.

The "other COVID-19-related topics" category emerged because the survey data collection period coincided with the pandemic. This topic included posts related to the pandemic that contained information about the origin of the coronavirus, political influence, financial interests, means of transmission, and COVID-19 prevention measures, and that did not specifically refer to the COVID-19 vaccine.

In relation to the content about vaccination, the most frequent concerns centered on distrust regarding the credibility/veracity of vaccines and dissemination of information claiming that vaccines cause disease. Emphasis was placed on questions about the efficacy and safety of vaccines, which took on significant proportions during the COVID-19 pandemic.

As for the dissemination of information stating that vaccines cause diseases, a globally known fact that probably impacted this last result was the publication of an article in the British journal The Lancet in 1998, which associated the MMR vaccine, which protects against measles, mumps, and rubella, with cases of autism and inflammatory bowel disease[27]. Investigations proved that the published results were not true, but the journal only removed the article from the internet and retracted it in 2010. However, the imagined association between the MMR vaccine and autism reverberates in the public's mind and, despite numerous scientific evidences, still constitutes a reason for parents to refuse the vaccine[35].

Most posts and/or sharing of certain content were made by the group administrator, who does not identify herself as a healthcare professional or health specialist. Research[14] indicates that most content posted on social media is produced and shared by individuals who are not experts in the subject matter. The dissemination of content that diverges from scientific evidence on social media creates public confusion and may intensify vaccine hesitancy[14]. In turn, effective communication can promote and facilitate adequate understanding about vaccination, impacting the reduction of vaccine hesitancy rates in countries that have these vaccines available[14].

The number of "likes" (comments or expressions regarding posts endorsing anti-vaccination content) and shares by group members to virtual environments outside the page demonstrated the widespread dissemination of content shared by this anti-vaccination group. These results, in addition to demonstrating the group members' engagement, reflect the magnitude of the problem regarding the dissemination of information, since sharing content outside this anti-vaccination environment can influence others.

Finding strategies to mitigate the spread of Fake News about vaccines on social media is of paramount importance, since as false information about vaccines circulates or conflicting information emerges, the general public's confusion is aggravated and the phenomenon of vaccine hesitancy can be intensified[14,15]. Healthcare professionals must be aware of the content posted on social media to equip themselves with scientific evidence and arguments to combat Fake News within society, whether in healthcare settings or in their social and virtual environments.

Regarding freedom of choice about whether or not to be vaccinated, a study carried out in the United States before the COVID-19 pandemic already pointed to an increase in refusals by parents or guardians to vaccinate children, with the argument of non-medical exemptions (not related to health reasons or medical restrictions), such as religious issues[36].

The influence of religion on human beings is well-known, and it is important to consider the positive influence it can have on the public in creating a positive culture around vaccination. Building closer ties between Basic Health Unit teams and religious institutions in the community, or between public agencies and religious leaders, can be an effective pro-vaccine strategy[37].

Another significant category among the topics was the discussion regarding the violation of freedom through mandatory vaccination. However, it is important to emphasize that vaccination is essential for preventing vaccine-preventable diseases and is the most cost-effective investment. Hence, it can be argued that vaccination goes beyond individual freedom, since vaccines are public health tools that benefit the community[1].

Concerning the violation of freedom and legal aspects of mandatory vaccination for children at the national level, the Child and Adolescent Statute (In Portuguese, Estatuto da Criança e do Adolescente – ECA)[38], in article 14, §1, provides for the mandatory vaccination of children in cases recommended by health authorities. In turn, the Brazilian Ministry of Health is responsible for defining the vaccines included in the national immunization schedule, although it does not establish the compulsory nature of vaccination.

Beyond the federal level, specific state and municipal regulations complement federal laws, establishing additional guidelines for childhood vaccination. For instance, in the state of São Paulo (Law 17,252/20)[39], regulations require students up to 18 years of age to present an up-to-date vaccination record upon school

enrollment in public and private schools offering early childhood, elementary, and high school education. Failure to present such documentation or the absence of mandatory vaccines will not prevent enrollment. However, the situation must be rectified within 60 days by a guardian. A guardian will then be notified immediately by the Child Protective Services Council for action. This fine may range from three to twenty reference wages and double the amount in the event of a repeat offense[39].

The results of this research provide data that can be used to develop educational projects and public policies aimed at vaccination campaigns. Health policymakers can adapt their communication strategies to effectively address these issues by identifying the main narratives and concerns expressed by anti-vaccination groups.

Understanding anti-vaccination groups' specific beliefs and concerns allows policymakers to tailor their educational messages to address these concerns directly and comprehensively. Given concerns about vaccine safety, educational campaigns could focus on providing clear, evidence-based information about the rigorous safety protocols followed during vaccine development and manufacturing.

By revealing issues related to vaccine credibility/veracity, the results of this study can guide the creation of public policies aimed at combating misinformation and promoting confidence in vaccination. This could include initiatives to increase health literacy and critical thinking skills, helping people discern between accurate and misleading information about vaccines. Partnerships with community leaders and influencers can be established to disseminate positive messages about the importance of vaccination.

Another practical application of this study's findings is the development of community engagement programs, in which healthcare professionals and educators work directly with anti-vaccination groups to address their concerns and provide accurate and unbiased information about vaccines. These programs can help build bridges between communities and health systems, fostering open and constructive dialogue about vaccination[40].

The dissemination of accurate vaccines information is essential to protect public health and prevent preventable diseases. It is Facebook's® responsibility to curb Fake News about vaccines, just as it does with other content, through reporting tools and artificial intelligence. Although Facebook® announced widely in October 2020 that it would ban anti-vaccination propaganda, this was not observed in practice, as the posts in the group were available in 2021. Therefore, it is important to monitor and conduct research to assess whether the actions implemented have been sufficient to remove absolutely all Fake News about vaccination from circulation.

CONCLUSION

An analysis of posts published in the Brazilian anti-vaccination group on Facebook® revealed the spread of misinformation and questions about vaccine efficacy and safety. Most of the posts consisted of secondary content, reproducing information from other non-scientific mainstream news sites, and were shared primarily on the personal pages of group members, propagating news that incites the anti-vaccine movement.

The most frequently discussed topics in the posts included the belief that vaccines can cause disease, questions about the credibility and veracity of vaccines, and reports of adverse reactions mistakenly linked to vaccines in some reproduced content.

By revealing the specific concerns expressed by anti-vaccination groups, it presents healthcare professionals and public policymakers at the federal, state, and municipal levels with a panorama that should be considered when planning communication strategies to significantly improving vaccination rates and protect public health against preventable diseases.

REFERENCES

1. Succi RCM. Vaccine refusal - what we need to know. J Pediatr (Rio J). 2018 Apr 12;94(6):574-81. https://doi.org/10.1016/j.jped.2018.01.008

2. Medeiros EAS. Entendendo o ressurgimento e o controle do sarampo no Brasil. Acta Paul Enferm. 2020 Mar;33:e-EDT20200001. https://doi.org/10.37689/acta-ape/2020EDT0001

3. Ministério da Saúde, Secretaria de Vigilância em Saúde (BR). Vigilância epidemiológica do sarampo no Brasil, 2019: janeiro a dezembro. Secretaria de Vigilância em Saúde [Internet]. 2020 Mar 6 [cited 2025 Aug 15];51(6):1-37. Available from: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2020/boletim-epidemiologico-vol-51-no-06.pdf

4. Figueiredo A, Simas C, Karafillakis E, Paterson P, Larson HJ. Mapping global trends in vaccine confidence and investigating barriers to vaccine uptake: a large-scale retrospective temporal modelling study. Lancet. 2020 Sept 10;396(10255):898-908. https://doi.org/10.1016/S0140-6736(20)31558-0

5. Nowak GJ, Cacciatore MA. State of vaccine hesitancy in the United States. Pediatr Clin N Am. 2023 Feb 24;70(2):197-210. https://doi.org/10.1016/j.pcl.2022.11.001

6. Agosti F, Toffolutti V, Cavalli N, Nivakoski S, Mascherini M, Aassve A. Information and vaccine hesitancy: Evidence from the early stage of the vaccine roll-out in 28 European countries. PLoS One. 2022 Sept 21;17(9):e0273555. https://doi.org/10.1371/journal.pone.0273555

7. Sherwood-Martin H. Vaccine hesitancy in Scandinavia. Lancet Infect Dis. 2024 Nov;24(11):1197. https://doi.org/10.1016/S1473-3099(24)00620-0

8. Stuetzle SCW, Willis M, Barnowska EJ, Bonkass AK, Fastenau A. Factors influencing vaccine hesitancy toward non-covid vaccines in South Asia: a systematic review. BMC Public Health. 2025 Apr 2;25:1246. https://doi.org/10.1186/s12889-025-22462-4

9. MacDonald NE; SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. Vaccine. 2015 Apr 17;33(34):4161-4. https://doi.org/10.1016/j.vaccine.2015.04.036

10. Acharya S, Aechtner T, Dhir S, Venaik S. Vaccine hesitancy: a structured review from a behavioral perspective (2015-2022). Psychol Health Med. 2024 Oct 28;30(1):119-47. https://doi.org/10.1080/13548506.2024.2417442

11. Sato APS. What is the importance of vaccine hesitancy in the drop of vaccination coverage in Brazil?. Rev Saude Publica. 2018 Nov 22;52:96. https://doi.org/10.11606/S1518-8787.2018052001199

12. World Health Organization (WHO). Ten threats to global health in 2019 [Internet]. World Health Organization (WHO); 2019 [cited 2025 Aug 15]. Available from: https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019

13. United Nations Children's Fund (UNICEF). The state of the world's children: 2023 for every child, vaccination: regional brief: East Asia and the Pacific [Internet]. New York: United Nations Children's Fund (UNICEF); 2023 Apr [cited 2025 Aug 15]. 22 p. Available from: https://digitallibrary.un.org/record/4011892

14. Jung M. Challenges of vaccinations in the era of new media communication. Health Care Manag (Frederick). 2018;37(2):142–6. https://doi.org/10.1097/

HCM.0000000000000207
15. Almeida AM. Movimento antivacinas na internet: da apropriação e recirculação do jornalismo de saúde ao empoderamento em grupos no Facebook [dissertation on the Internet]. [Curitiba]: Universidade Federal Do Paraná; 2019 [cited 2025 May 20]. Available from: https://hdl.handle.net/1884/64287
16. Ahmed A, Lee KS, Bukhsh A, Al-Worafi YM, Sarker MR, Ming LC, et al. Outbreak of vaccine-preventable diseases in Muslim majority countries. J Infect Public Health. 2017 Oct 4;11(2):153-5. https://doi.org/10.1016/j.jiph.2017.09.007
17. Barbieri CLA, Couto MT, Aith FMA. A (não) vacinação infantil entre a cultura e a lei: os significados atribuídos por casais de camadas médias de São Paulo, Brasil. Cad. Saúde Pública. 2017;33(2):e00173315. https://doi.org/10.1590/0102-311X00173315
18. Lafnitzegger A, Gaviria-Agudelo C. Vaccine hesitancy in pediatrics. Adv Pediatr. 2022 June 20;69(1):163-76. https://doi.org/10.1016/j.yapd.2022.03.011
19. Jones M, James J. Role of the nurse in addressing vaccine hesitancy and misinformation on social media. Nurs Stand [Internet]. 2021 Dec 1[cited 2025 May 20];36(12):e11759. Available from: https://eprints.bournemouth.ac.uk/36126/
20. Mønsted B, Lehmann S. Characterizing polarization in online vaccine discourse - a large-scale study. PLoS One. 2022 Feb 9;17(2):e0263746. https://doi.org/10.1371/journal.pone.0263746
21. Mizuta AH, Succi GM, Montalli VAM, Succi RCM. Percepções acerca da importância das vacinas e da recusa vacinal numa escola de medicina. Rev paul pediatr. 2018 Aug 3;37(1):34-40. https://doi.org/10.1590/1984-0462/;2019;37;1;00008
22. Spires B, Brewton A, Maples JM, Ehrlich SF, Fortner KB. Vaccine hesitancy in women's health. Obstet Gynecol Clin North Am. 2023 May 4;50(2):401-19. https://doi.org/10.1016/j.ogc.2023.02.013
23. Gilliland K, Kilinsky A. Vaccine hesitancy: where are we now? Pediatr Ann. 2025 May 1;54(5):e154-9. https://doi.org/10.3928/19382359-20250307-01
24. European Centre for Disease Prevention and Control (ECDC). Systematic scoping review on social media monitoring methods and interventions relating to vaccine hesitancy [Internet]. Stockholm: European Centre for Disease Prevention and Control (ECDC); 2020 [cited 2025 May 20]. 78 p. Available from: https://www.ecdc.europa.eu/sites/default/files/documents/vaccine-hesitancy-systematic-scoping-review-social-media.pdf
25. Wilson SL, Wiysonge C. Social media and vaccine hesitancy. BMJ Glob Health. 2020 Oct 23;5(10):e004206. https://doi.org/10.1136/bmjgh-2020-004206
26. Puri N, Coomes EA, Haghbayan H, Gunaratne K. Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases. Hum Vaccin Immunother. 2020 July 21;16(11):2586-93. https://doi.org/10.1080/21645515.2020.1780846
27. Ma J, Stahl L. A multimodal critical discourse analysis of anti-vaccination information on Facebook. Libr Inf Sci Res. 2017 Nov 23;39(4):303-10. https://doi.org/10.1016/j.lisr.2017.11.005
28. Hoffman BL, Felter EM, Chu KH, Shensa A, Hermann C, Wolynn T, et al. It's not all about autism: The emerging landscape of anti-vaccination sentiment on Facebook. Vaccine. 2019 Mar 21;37(16):2216-23. https://doi.org/10.1016/j.vaccine.2019.03.003
29. Martin S, Kilich E, Dada S, Kummervold PE, Denny C, Paterson P, et al. "Vaccines for pregnant women…?! Absurd" - Mapping maternal vaccination discourse and stance on social media over six months. Vaccine. 2020 Aug 9;38(42):6627-37. https://doi.org/10.1016/j.vaccine.2020.07.072
30. Smith SE, Sivertsen N, Lines L, de Bellis A. Exploring social media influences on vaccine decision-making in parents: a netnography. Ther Adv Vaccines and Immunother. 2024 May 8;12. https://doi.org/10.1177/25151355241249607
31. Zintel S, Flock C, Arbogast AL, Forster A, von Wagner C, Sieverding M. Gender differences in the intention to get vaccinated against COVID-19: a systematic review and meta-analysis. J Public Health. 2022 Jan 7;31:1303-27. https://doi.org/10.1007/s10389-021-01677-w
32. Branco FSSR. Influência e caracterização do movimento antivacinação nas redes sociais em Portugal [dissertation on the Internet]. [Lisboa]: Universidade Nova de Lisboa; 2021 Aug [cited 2025 Aug 15]. Available from: https://run.unl.pt/bitstream/10362/131416/1/FILIPA_BRANCO_57573_MCC.pdf
33. Ançanello JV, Casarin HCS, Furnival AC. Competência em informação, fake news e desinformação: análise das pesquisas no contexto brasileiro. Em Quest. 2023 Aug 11;29:e–125782. https://doi.org/10.1590/1808-5245.29.125782
34. Ashkenazi S, Livni G, Klein A, Kremer N, Havlin A, Berkowitz O. The relationship between parental source of information and knowledge about measles/measles vaccine and vaccine hesitancy. Vaccine. 2020 Sept 25;38(46):7292-8. https://doi.org/10.1016/j.vaccine.2020.09.044
35. Gabis LV, Attia OL, Goldman M, Barak N, Tefera P, Shefer S, et al. The myth of vaccination and autism spectrum. Eur J Pediatr Neurol. 2021 Dec 22;36:151-8. https://doi.org/10.1016/j.ejpn.2021.12.011
36. Olive JK, Hotez PJ, Damania A, Nolan MS. The state of the antivaccine movement in the United States: a focused examination of nonmedical exemptions in states and counties. PLoS Med. 2018 July 6;15(7):e1002616. https://doi.org/10.1371/journal.pmed.1002616
37. Nashwan AJ, Abuhammad S. Zero-dose children, misinformation, and vaccine hesitancy. Cureus. 2025 Apr 10;17(4):e82028. https://doi.org/10.7759/cureus.82028
38. Lei Nº 8.069 da Presidência da República, de 13 de julho de 1990 (BR) [Internet]. Dispõe sobre o Estatuto da Criança e do Adolescente e dá outras providências. Diário Oficial da União. 1990 July 13 [cited 2025 Aug 15]. Available from: https://www.planalto.gov.br/ccivil_03/leis/l8069.htm
39. Lei Nº 17.252 da Assembleia Legislativa do Estado de São Paulo, de 17 de março de 2020 (BR) [Internet]. Dispõe sobre a obrigatoriedade da apresentação nas redes pública e particular da carteira de vacinação no ato da matrícula escolar. Assessoria Técnica da Casa Civil. 2020 Mar 17 [cited 2025 Aug 15]. Available from: https://www.al.sp.gov.br/repositorio/legislacao/lei/2020/lei-17252-17.03.2020.html
40. Crosby LE, Real FJ, Cunnigham J, Mitchell M. Overcoming vaccine hesitancy using community-based efforts. Pediatr Clin North Am. 2023 Feb 24;70(2):359-70. https://doi.org/10.1016/j.pcl.2022.11.012

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ADW: formal analysis; writing – original draft and writing – review & editing.
ASCBA: conceptualization; data curation; formal analysis; investigation; project administration; supervision; writing – original draft and writing – review & editing.
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Conflict of interest

None.