Research Note

Research note: Bolsonaro's firehose: How Covid-19 disinformation on WhatsApp was used to fight a government political crisis in Brazil

Brazil has one of the highest rates of cases and deaths attributed to Covid-19 in the world. Two factors contributed to the high rates: the Brazilian government underestimated the pandemic and a large amount of disinformation was spread through social media. We found that disinformation about Covid-19 on WhatsApp was associated with political disinformation, mostly composed to support president Bolsonaro during the crisis he faced at the beginning of the pandemic. Our main finding implicates that disinformation on WhatsApp was connected to the far-right political discourse and framed Covid-19 as a political issue rather than a public health issue.

Authors: Felipe Bonow Soares (1), Raquel Recuero (2, 3), Taiane Volcan (1), Giane Fagundes (2), Giéle Sodré (4)
Affiliations: (1) Media, Discourse and Social Networks Research Lab (MIDIARS), Brazil, (2) Center for Languages and Communication, Federal University of Pelotas, Brazil, (3) Faculty of Library Sciences and Communication, Federal University of Rio Grande do Sul, Brazil, (4) Journalism Department, Federal University of Pelotas, Brazil

Research questions

- What are the topics of messages containing disinformation about Covid-19 on WhatsApp public groups in Brazil?
- What are the types of disinformation about Covid-19 on WhatsApp?

Research note summary

- We used *WhatsApp Monitor* (Resende et al., 2018) to collect the most shared textual messages from more than 500 public political groups in Brazil during March and April 2020. Our final dataset was composed of 802 messages that contained some type of disinformation about Covid-19.
- For this dataset, we used content analysis to categorize the types of disinformation and the topics of these messages. We returned to our dataset for a more in-depth qualitative analysis to make inferences about the quantitative results.
- Disinformation on WhatsApp political groups was often connected to conspiracy theories, such as alleged plots by the "leftists," the Brazilian Supreme Court, and by media outlets to overthrow or

---

harm Bolsonaro. Some messages also claimed that China intentionally created the virus. Misleading information and fabricated content were used, moreover, to minimize the pandemic and detract from Bolsonaro's opposers.

- Our findings also suggest that disinformation about Covid-19 followed a pattern of connection with political themes that were in the public debate in the country. Moreover, disinformation about the virus was politically framed, which benefited far-right views and helped circumvent a political crisis that could have harmed Bolsonaro's government.

Implications

In this study, we analyzed disinformation about Covid-19 on WhatsApp and its connection to the political debate in Brazil. Brazil was heavily hit by Covid-19, partially because of the different discourses from government authorities about the seriousness of the pandemic. From the beginning, for example, Brazil's far-right president Jair Bolsonaro minimized Covid-19. He publicly called it a "little flu," advocated for the end of measures such as social distancing and quarantine (which were put in place by state governors and mayors), and constantly appeared in public hugging his supporters without wearing a mask. The Health Minister at the time, Luiz Henrique Mandetta, on the other hand, strongly followed WHO recommendations, establishing measures of social distancing and publicly asking for people to use face masks to underline the seriousness of the pandemic. Most state governors and mayors supported Mandetta. In this context, two opposing discourses emerged: one reinforcing WHO recommendations about the seriousness of the situation and following scientific evidence, and another minimizing the pandemic (Sandy & Milhorance, 2020). Amidst this dispute, many people refused to wear masks, and multiple protests against the Covid-19 containment measures and social distancing protocols erupted, which were lead predominantly by Bolsonaro's supporters. The pandemic quickly escalated in Brazil, with cases rapidly climbing from fewer than 100 cases in early March to more than 100,000 cases and over 8,000 deaths by early May. By the end of 2020, Brazil had one of the highest numbers of cases (over 7.5 million) and deaths (almost 200,000) in the world.[2]

Brazil's case demonstrates how disinformation can undermine public health strategies used by authorities and create a context in which people may choose not to follow scientific evidence and recommendations due to their political views. Political groups on WhatsApp may have played a central role in promoting the defiance of Covid-19 guidelines and regulations, since they already had part in spreading disinformation during elections and other key political moments (Reis et al., 2020). WhatsApp is the most popular communication app in Brazil and an important space for users to find and share information (Resende et al., 2018). According to the Reuters Institute Digital News Reports (Newman et al., 2020), 48% of Brazilians use WhatsApp for news consumption. Similarly, Baptista et al. (2019) found that 57% of Brazilians consider WhatsApp an important or very important source of political information. WhatsApp is also a key channel for spreading false information (Newman et al., 2020), particularly because it can't be traced or debunked publicly by fact-checkers.

The problem of disinformation and its connections to partisanship and, particularly, the far-right has been explored by researchers in different contexts. Hindman and Varash (2018) have shown that the far right and Russian trolls have created communication strategies for disseminating elections-related disinformation on social media in the United States. Pierri et al. (2019) have described similar strategies in Italy. Alves (2016, 2019) has also pointed out how Brazil's far right has taken control of social media strategies to massively create and share disinformation and hate campaigns targeted at political

---

[2] See https://www.nytimes.com/interactive/2020/world/americas/brazil-coronavirus-cases.html

adversaries.

In this article, we discuss disinformation about Covid-19 on WhatsApp in Brazil. In particular, we look at the topics and types of disinformation messages spread in political public groups on the app. Our findings imply that WhatsApp may have had a role in spreading disinformation about the disease through these groups, particularly by aligning untruthful content with political views. The disinformation spread may also have negatively influenced how people within the groups we monitored responded to the containment measures proposed by health authorities, particularly if these people were politically aligned with Bolsonaro. We understand disinformation as distorted, manipulated, or entirely false information that is created to mislead and achieve political gains (Benkler et al., 2018; Fallis, 2015). It is created intentionally to influence public opinion. Accordingly, disinformation is dangerous because it might negatively affect the public sphere (Tucker et al., 2018).

Disinformation has been categorized by many. Wardle (2019), for example, considers seven categories of information disorder: *satire and parody*, *false connection*, *misleading content*, *false context*, *imposter content*, *manipulated content*, and *fabricated content*. Similarly, Brennen et al. (2020) divide disinformation into three categories: *satire and parody*, *reconfigured*, and *fabricated*. We use categories similar to Brennen et al. (2020); however, instead of *reconfigured*, we use *distortion*. We created a specific category for *conspiracy theories*, and we do not use *satire and parody* as a category. We removed *satire and parody* because, as we understand this category, it is about the "form" of disinformation, not the "content." Thus, our classification system has three categories of disinformation:

(1) *distortion*—content based on factual information that is distorted to mislead, such as information out of context, false connections, information biased reconfigured in some way;

(2) *fabricated information*—completely false content, such as fake audios and made up information;

(3) *conspiracy theory*—a narrative based on a conspiracy plot from a sinister group that lacks any evidence.

Conspiracy theory differs from the two other categories because its key characteristic is the narrative describing obscure plots of social manipulation (for example, the conspiracy that China created the virus to win World War III)—and it does not matter whether the narrative is based on distorted factual information or completely false content.

As we aimed to explore the connections between Covid-19 disinformation and political issues, we looked at the topics mentioned in the messages and their connection to the mainstream media political agenda during the period covered by our analysis (March and April 2020). Furthermore, we compared shares distribution and topic frequency with the political debate in Brazil to evaluate how the political debate impacted on disinformation. As other studies have noted, polarization fuels disinformation and leads to different responses, even in the health context of the Covid-19 pandemic (Allcott et al., 2020; Recuero & Soares, 2020; Recuero et al., 2020).

As we discuss in the next section, disinformation about Covid-19 in Brazil was connected to political discourse within the country. Disinformation seems to have been connected to partisanship and, particularly, to Bolsonaro (see Finding 1, below). This implies that the support for certain political figures may be a strong motivator for circulating disinformation. Moreover, it also implies that legitimizing discourse of political leaders may also help spread disinformative content. Therefore, public authorities should find ways to punish political and other prominent public figures for spreading and legitimating untruthful content. That is, public authorities should act to develop legal procedures to address disinformation spread by political leaders. This could reduce the amount of disinformation spread by political leaders. In addition, our findings show how WhatsApp groups function as spaces that incite the spread of disinformation to other, more closed groups. This suggests that the only way WhatsApp could limit or avoid the spread of disinformation from is by flagging disinformation as such through debunked fact-checking stories, similar to what Reis et al. (2020) have also proposed.

Findings

Finding 1: Covid-19 related disinformation on WhatsApp was largely political and provided a pro-Bolsonaro framing of the pandemic.

On March 17, Brazilians started banging pots from their windows every day at the same time to protest against Bolsonaro's lack of action against the pandemic, calling for his impeachment ("Coronavirus protest in Brazil", 2020). In the same period, several governors and mayors announced social distancing measures against Bolsonaro's will (Marques, 2020). This crisis resulted in Bolsonaro's worst approval rating since the beginning of his presidency. His response to the pandemic was condemned by 65% of Brazilians (Marcello & Brito, 2020). At the same time, political players that produced opposing discourse saw an increase in their approval ratings, such as governors and mayors (54% approved their response to the pandemic) and the Brazilian Health Minister Luiz Henrique Mandetta (55% approval rating).
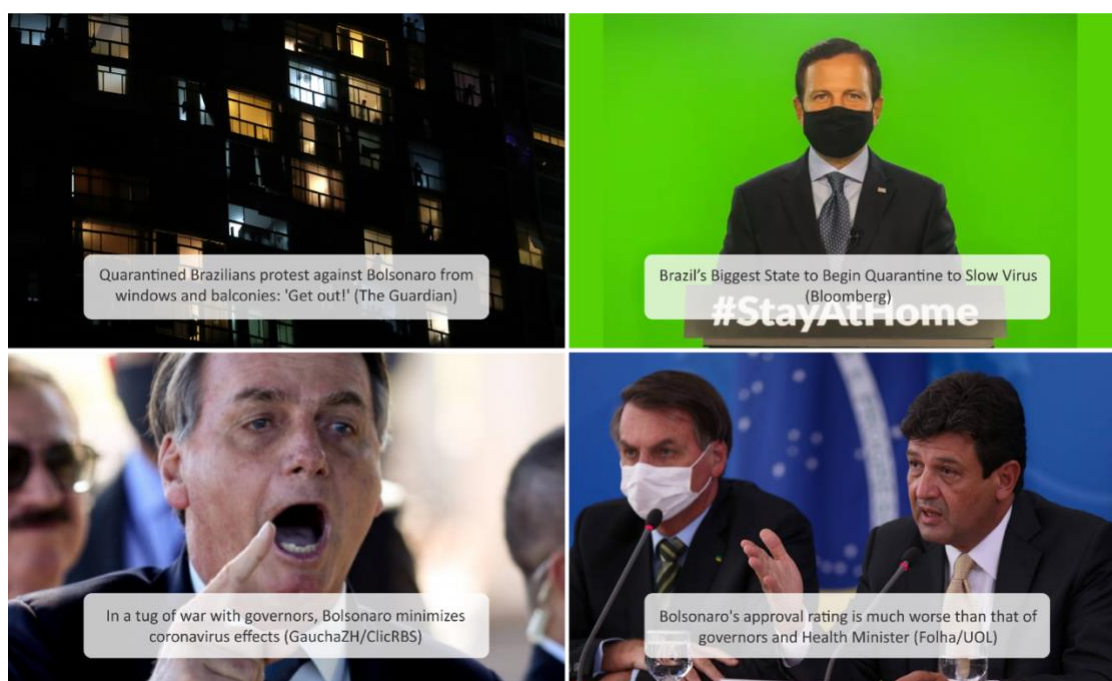
Figure 1. Headlines from the crisis.

As a response to this crisis, Bolsonaro made a public pronouncement on live television on March 24. In his speech, he criticized social distancing measures and, thus, governors, mayors, and Mandetta. He also called for Brazilians to go back to their normal lives, arguing the virus was not as serious as it had been made out to be. His speech started a disinformation campaign that connected social distancing measures, health authorities, and governors and mayors to the "left" and to "communism," and the pandemic to a conspiracy.

In Figure 2, we show the distribution of disinformation over time. Right after Bolsonaro's pronouncement, there was a huge spike in Covid-19 disinformation within the WhatsApp groups we studied. The topics from Bolsonaro's speech were also central in the messages we identified that contained disinformation. The prevalence of these topics within the messages studied indicates that Bolsonaro's speech might have fueled disinformation spread. Another public pronouncement on March 31, in which Bolsonaro affirmed he wanted to save the economy and claimed people needed to go back to work, also increased disinformation spread the day after.
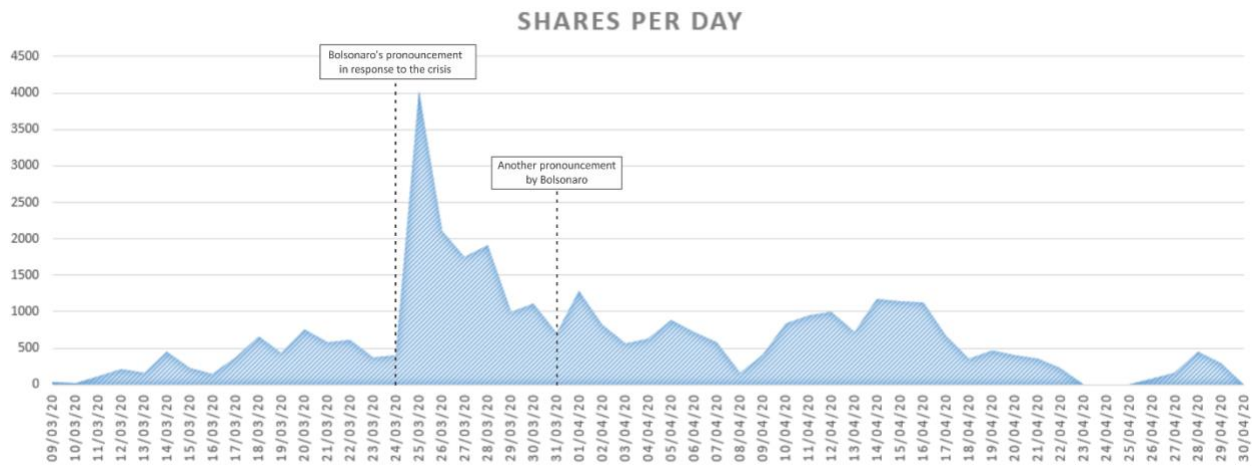
SHARES PER DAY

Figure 2. Number of shares per day.

To understand how disinformation was connected to political events, we analyzed the most frequent topics on the messages (categories were not exclusive - Figure 3) and their connections (Figure 4). The majority of disinformation (42%) was connected to how social distancing measures would hurt the economy. Other topics included the governors and mayors and their "hidden interests" against Bolsonaro (36%); how China had engineered the virus (27%); how the media (21%), the Congress (13%), the leftists (16%), the Brazilian Supreme Court (9%), Mandetta (6%) and others were all conspiring to defeat Bolsonaro.

To understand the connections between the themes and their relevance, we calculated the Pearson's correlation coefficient between the topics and created a graph to visualize this data (see Figure 4) – each topic is a node and the ties connect significant positively correlated topics. Node size represents how many other nodes a topic is connected to. We also used modularity to identify topics that most frequently appeared together (different colors). The data support the strength of the political framing of the pandemic, with "leftists" as the most central concept, connected to almost all political players that produced a discourse opposed to Bolsonaro. Many disinformation messages accused these political actors of being "leftists" or "communists." This political argument was used to frame all discourses that discredited Bolsonaro's as created by political opposition. Thus, polarization between "us" (the good) and "them" (the evil) was one key strategy for spreading disinformation. Most clusters connect political actors and health authorities to Bolsonaro and his criticism of social distancing.
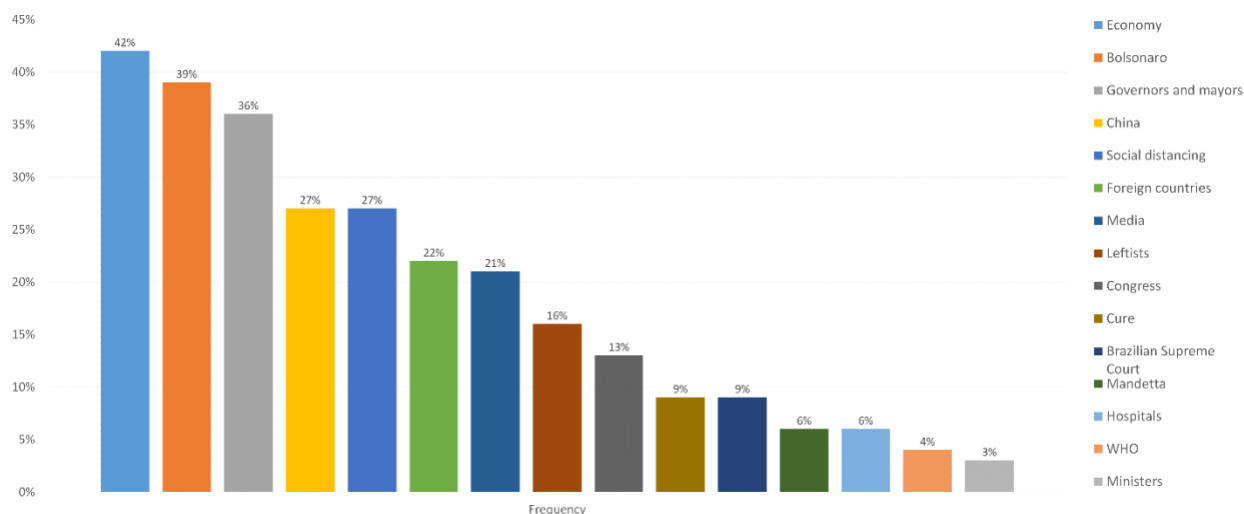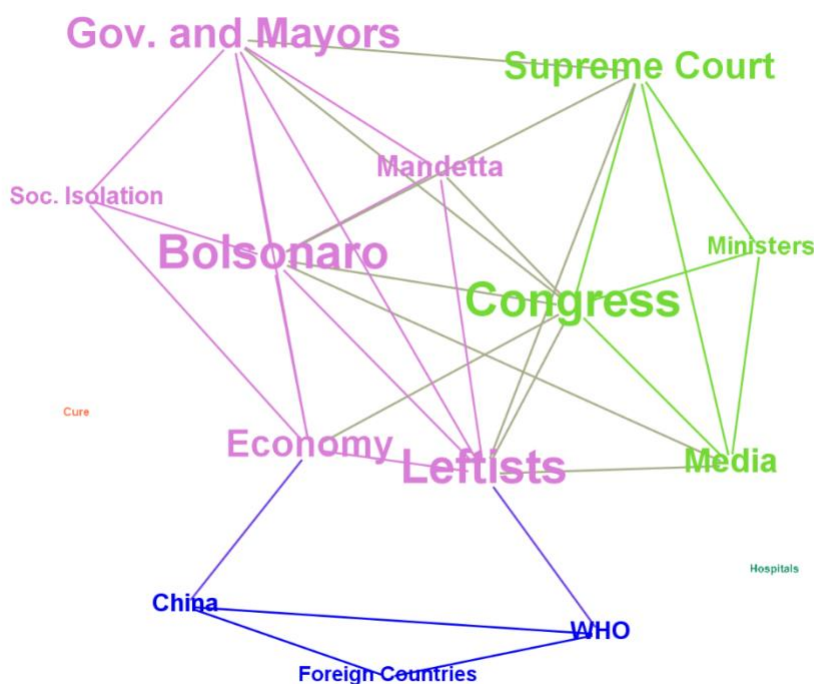
Figure 3. Frequency of topics.

Figure 4. Network of correlated topics in the messages.

Finding 2: Conspiracy theories and distortion were the most frequent types of disinformation in the messages analyzed.

Most studies have found that distortion is the most frequent type of disinformation on many social media platforms. For example, Brennen et al. (2020) studied Twitter, Facebook, and YouTube, and Recuero and Soares (2020) analyzed Twitter in Brazil; the categories used in these studies were slightly different from ours, but both studies included *distortion*, *fabricated information*, and *conspiracy theories* as categories or subcategories. However, conspiracy theories were the most prevalent category in our dataset (41%).

Although some found evidence of conspiracy theories about Covid-19 on Twitter (see Gruzd & Mai, 2020), there were fewer messages with these characteristics compared to other types. For example, Brennen et al. (2020) identified conspiracy theories as only 17% of their dataset. The second most frequent type of disinformation we identified was distortion (39%) and the third, fabricated information (20%). This result highlights the importance of considering platform differences in this type of research.

Conspiracy theories were strongly correlated to the theme "China" ($r(800)$ = .53, p < .001). These messages often accused the Chinese (as the representatives of "communism") of creating the virus for economical gain (see Figure 5).

CHINA WINS WORLD WAR 3, WITH THE GREATEST LIE OF THE CENTURY: "CORONAVIRUS!" China cowardly has just won World war 3 with biological lies, an economic and lying scam, destroyed all the productive economies that negotiated with them without firing a single shot. China is a coward, cruel and a liar, this is communist China, warts and all. We will spend months trying to recover from the damage caused by this monster, called China !!! With the crisis caused by them, they bought billions in companies around the world, and may be very close to controlling them now, we will become slaves, as well as its people, guaranteeing the privileges of a communist and voracious elite! After the announcement and the stock market crash around the world, China buys immediately, with a huge devaluation, most of the shares of foreign companies, where are they? In China of course, what a great coincidence !!! Why? Because now China becomes the largest shareholder of all, I spoke of "all" foreign companies installed, where exactly? In China, look at another great coincidence !!! China is already starting to dismantle the assembled hospitals, for the control of the virus, and tells the world: Thank you very much suckers, you can return to your normal lives, we have already gained a lot of money and power, COMMUNIST China thanks you."

Figure 5. Conspiracy theory about China.

Conspiracy theories were also correlated to other political topics, such as Brazilian Congress ($r(800)$ = .15, p < .001), media outlets ($r(800)$ = .20, p < .001), Brazilian Supreme Court ($r(800)$ = .08, p < .05), and "leftists" and "communists" ($r(800)$ = .18, p < .001). Narratives accusing several actors of plotting against Bolsonaro were frequently found during the political crisis he faced (figure 6).

THE COMMUNIST VERMINOUS RASCAL BANDITS MAIA, ALCOLUMBRE+TOFOLLI AND DÓRIA ARE COORDINATING A MACABRE PLAN TO OVERTHROW OUR PRESIDENT TODAY!!! THEY ARE TAKING ADVANTAGE OF THE CORONAVIRUS CRISIS, MANIPULATED BY THE COMMUNIST MEDIA GLOBOTRASH+CNN+BAND TO CAUSE SOCIAL CHAOS AND SO BLAME THE PRESIDENT. PRESIDENT BOLSONARO NEEDS TO ACTIVATE THE "STATE OF SIEGE" IMMEDIATELY TO SAVE THE NATION FROM THE DOOM OF ECONOMIC CHAOS!! THEY WANT TO TRANSFORM US INTO A NEW AND 1,000,000 TIMES WORSE VENEZUELA! THE DECREE OF THE "STATE OF SIEGE" DOES NOT DEPEND ON THE APPROVAL OF THE DAMN CONGRESS + SUPREME COURT. IT IS EXCLUSIVE PREROGATIVE OF THE EXECUTIVE POWER!!

Figure 6. Conspiracy theory about politics in Brazil.

Distortion and fabricated content were also used to support Bolsonaro. Distorting messages often criticized social distancing measures ($r(800) = .29$, $p < .001$), and reinforced Bolsonaro's positions (figure 7). Fabricated information was used, for example, to state that hydroxychloroquine was the cure ($r(800) = .09$, $p < .05$) for Covid-19 (see Figure 8). Bolsonaro claimed the same.

SUMMARY OF Bolsonaro's SPEECH. 1. People who are not at risk groups must return to work so that the country does not go bankrupt. 2. But, who is at risk group (people over 60, pregnant women, with low immunity, high blood pressure, diabetics, with cancer, etc.), must remain in isolation. BAD INTERPRETATION I NOTICED FROM THE PEOPLE: 1. Some people thought he told everyone to come back, which is not true. 2. Some people did not understand the reference about the flu, because they do not follow Twitter, nor the person Bolsonaro mentioned who said the same thing, which in this case is Drauzio Varella. Anyway, it is something that adds nothing to the speech. THAT IS - healthy people working - group risk isolated. WHY? - otherwise the country will collapse. - some governors are already closing their cities and are not even letting food in. - some other governors ordered the loot of drug distributors. - chaos will set in with panic and hysteria. Do your part, keep your friends well informed

Figure 7. Distorting message about social isolation.

97-year-old diabetic with only one kidney, history of cancer and heart disease cured with hydroxychloroquine and azithromycin [link to hyperpartisan outlet]

Figure 8. Fabricated information about hydroxychloroquine.

The data show that disinformation about Covid-19 on WhatsApp in Brazil followed a pattern of framing the pandemic as a conspiracy and its combat measures as strategies to undermine Bolsonaro's government. Disinformation was used to fight the political crisis the president was in, offering "alternative" stories to support his discourse. Moreover, these messages framed the public health issue as a political one (the "leftists" vs. Bolsonaro), taking advantage of the political polarization in Brazil.

Methods

In this study, we aimed to understand the topics and the types of disinformation about Covid-19 on WhatsApp in Brazil. We analyzed a sample of disinformation messages from public political groups. Most interactions on WhatsApp are private, so it is hard to track data from the app. To create our sample, we used WhatsApp Monitor (Resende et al., 2018) to collect data from more than 500 WhatsApp public groups in Brazil. The public groups tracked are for political discussion and news sharing. The system provides an overview of the content shared on WhatsApp, as it stores multiple content categories such as images, videos, audio, and textual messages and displays the most shared content per day in these groups. We only have information about the content shared in the groups, so we do not know how many times the messages we analyze were shared from the tracked public groups to other groups or one-to-one conversations. The WhatsApp Monitor does not store sensitive data, such as usernames and phone numbers. Therefore, we used only data from public groups and without any identification of the users to avoid ethical issues.

Data collection

Two authors accessed the WhatsApp Monitor system and manually collected textual messages that we considered to contain disinformation about Covid-19. We collected textual messages that were shared at least 20 times in one day within the monitored groups from March 1 to April 30, 2020. If a message was shared at least 20 times in two days, then we collected it twice. We decided to keep the duplicated messages because they were potentially shared in different groups which helped us to analyze the distribution of the shares per day. We retrieved a dataset of 810 messages. During the content analysis (detailed below), we removed eight messages that we did not classify as disinformation. Our final dataset comprised 802 messages (727 unique messages) that were shared almost 35,000 times in the groups that WhatsApp Monitor tracks. Our dataset consists of about a third of the total number of messages shared at least 20 times a day in the monitored groups in March and April 2020 (nearly 2,400 messages). We selected this particular timeframe because it was the beginning of the Covid-19 spread in Brazil. Due to Bolsonaro's response to the pandemic, it was a period of political instability and polarized discourses. With this timeframe, we were able to map the beginning of the disinformation campaign on WhatsApp and its connections to the political debate in the country. We also monitored several news outlets to make inferences about the connection between public discourse, disinformation spread, and the topics mentioned in the messages.

Data analysis

To understand the characteristics of the disinformation we used content analysis. We first made a preliminary analysis of the dataset, looking at the major characteristics of the messages, the topics mentioned, and so on. We then separately coded the types of disinformation and the topics of the messages. The authors of this essay performed the content analysis. We discussed the disinformation categories based on a preliminary analysis of the dataset, but we did not conduct any prior training on a separate data set nor the data set used in this study. Two coders manually annotated all 810 messages to classify the types of disinformation (*distortion*, *fabricated information*, and *conspiracy theory*). The categories were mutually exclusive. For the coding schema, we used the definitions outlined in the arguments and implications section. We calculated Krippendorff's alpha to measure the reliability of our coding. The overall score was moderate to substantial (α = .601). Types of disinformation are interpretative categories, which explains the agreement score. To have more confidence in our final classification, we used a third coder to solve the disagreements (tiebreaker), so two coders agreed on the final categorization for each message. As mentioned above, eight messages were removed from the original dataset because they were not considered disinformation by the coders. Three coders manually annotated the topics in the 802 messages. The coders were asked whether the message contained each of the topics we created based on the preliminary analysis. Topics categories were not exclusive. The overall Krippendorff's alpha score was a substantial (α = .675). We used the agreement of at least two coders for the final decision. We used Freelon's (2010) ReCal2 and ReCal3 to calculate intercoder reliability. For the qualitative inferences we made and to select the examples we presented in the essay, we returned to the data for a more qualitative deep reading of the messages. We used SPSS to run Pearson's correlation tests on the data. We used Gephi to create a graph of the correlated topics. We manually created an edge list based on the positively correlated topics with statistical significance. Although some of the correlations were small (r < .2), we decided to report them because they helped us identify topics that were mentioned in similar contexts. In Figure 4, each node represents one topic and the ties connect positively correlated topics. We used modularity to identify the clusters and the degree to define the size of the nodes.

Limitations

This study has some limitations. We only had access to public groups monitored by WhatsApp Monitor. Although it monitors more than 500 public groups, we were not able to measure the spread of the disinformation messages in other groups and interpersonal conversations on WhatsApp. Therefore, our data was based on a sample of the messages on WhatsApp, and we could not measure how prevalent these messages were in the broader community. Also, we only analyzed textual messages. Disinformation is also spread in videos and images, and we likely missed part of the disinformation messages spread on WhatsApp. In addition, there is a bias in the political public groups monitored by WhatsApp Monitor, as many of them are groups for Bolsonaro's supporters.

Bibliography

Allcott, H., Boxell, L., Conway, J. C., Gentzkow, M., Thaler, M., & Yang, D. Y. (2020). *Polarization and public health: Partisan differences in social distancing during the coronavirus pandemic* (National Bureau of Economic Research Working Paper No. 26946). https://doi.org/10.3386/w26946

Alves, M. (2016). Campanha não oficial–A rede antipetista na eleição de 2014 [Unofficial campaign – The "against PT net" in the 2014 election]. *Fronteiras-estudos midiáticos*, *19*(1), 102-119. https://doi.org/10.4013/fem.2017.191.10

Alves, M. (2019). *Desarranjo da visibilidade, desordem informacional e polarização no Brasil entre 2013 e 2018* [Visibility disruption, information disorder, and polarization in Brazil between 2013 and 2018] [Doctoral dissertation]. Federal Fluminense University. https://app.uff.br/riuff/handle/1/15381

Baptista, E. A., Rossini, P., Oliveira, V. V., & Stromer-Galley, J. (2019). A circulação da (des)informação política no WhatsApp e no Facebook [The circulation of political (mis)information on WhatsApp and Facebook]. *Lumina*, *13*(3), 29-46. https://doi.org/10.34019/1981-4070.2019.v13.28667

Benkler, Y. Faris, & R. Roberts, H. (2018). *Network propaganda: Manipulation, disinformation, and radicalization in American politics.* Oxford University Press.

Brennen, J. S., Simon, F., Howard, P. N., & Nielsen, R. K. (2020). *Types, sources, and claims of COVID-19 misinformation*. Reuters Institute for the Study of Journalism, University of Oxford. https://reutersinstitute.politics.ox.ac.uk/types-sources-and-claims-covid-19-misinformation

Coronavirus protest in Brazil sees millions bang pots from balconies (2020, March 19). BBC News. https://www.bbc.com/news/world-latin-america-51955679

Fallis, D., (2015). What Is disinformation? *Library Trends*, *63*(3), 401-426. https://doi.org/10.1353/lib.2015.0014

Freelon, D. (2010). ReCal: Intercoder reliability calculation as a web service. *International Journal of Internet Science*, *5*(1), 20-33. https://www.ijis.net/ijis5_1/ijis5_1_freelon.pdf

Gruzd, A., & Mai, P. (2020). Going viral: How a single tweet spawned a COVID-19 conspiracy theory on Twitter. *Big Data & Society*, *7*(2), 1-9. https://doi.org/10.1177/2053951720938405

Hindman, M, & Varash, V. (2018). *Disinformation, fake news and influence campaigns on Twitter*. John S. and James L. Knight Foundation. https://knightfoundation.org/reports/disinformation-fake-news-and-influence-campaigns-on-twitter/

Marcello, M. C., & Brito, R. (2020). *Brazil's Bolsonaro walks back decree to suspend worker pay amid coronavirus*. Reuters Institute. https://www.reuters.com/article/us-health-coronavirus-brazil/brazils-bolsonaro-walks-back-decree-to-suspend-worker-pay-amid-coronavirus-idUSKBN21A27O

Marques, F. (2020). *Brazil's biggest state to begin quarantine to slow virus.* Bloomberg. https://www.bloomberg.com/news/articles/2020-03-21/brazil-s-biggest-state-is-set-to-begin-quarantine-to-slow-virus

Newman, N., Fletcher, R., Schultz, A., Andi, S., & Nielsen, R. K. (2020). *Reuters Institute Digital News Report 2020*. Reuters Institute for the Study of Journalism, University of Oxford. https://www.digitalnewsreport.org/

Pierri, F., Artoni, A., & Ceri, S. (2020). Investigating Italian disinformation spreading on Twitter in the context of 2019 European elections. *PLoS ONE*, *15*(1), e0227821. https://doi.org/10.1371/journal.pone.0227821

Recuero, R., & Soares, F. (2020). O discurso desinformativo sobre a cura do COVID-19 no Twitter: Estudo de caso [The disinformation discourse about COVID-19's cure on Twitter: A case study]. *E-Compós*. https://doi.org/10.30962/ec.2127

Recuero, R., Soares, F. B., & Gruzd, A. (2020). Hyperpartisanship, disinformation and political conversations on Twitter: The Brazilian presidential election of 2018. *Proceedings of the International AAAI Conference on Web and Social Media*, *14*(1), 569-578. https://aaai.org/ojs/index.php/ICWSM/article/view/7324

Reis, J. C. S., Melo, P., Garimella, K., & Benevenuto, F. (2020). Can WhatsApp benefit from debunked fact-checked stories to reduce misinformation? *Harvard Kennedy School (HKS) Misinformation Review, 1*(5). https://doi.org/10.37016/mr-2020-035

Resende, G., Messias, J., Silva, M., Almeida, J., Vasconcelos, M., & Benevenuto, F. (2018). A system for monitoring public political groups in WhatsApp. In M. C. M. Neto, R. L. Novais, C. Ferraz, & W. Viana (Eds.), *WebMedia '18: Proceedings of the 24th Brazilian Symposium on Multimedia and the Web* (pp. 387–390). https://doi.org/10.1145/3243082.3264662

Sandy, M., & Milhorance, F. (2020, April 6). Brazil's president still insists the coronavirus Is overblown. These governors are fighting back. *Time*. https://time.com/5816243/brazil-jair-bolsonaro-coronavirus-governors/

Tucker, J. A., Guess, A., Barberá, P., Vaccari, C., Siegel, A., Sanovich, S., Stukal, D., & Nyhan, B. (2018). *Media, political polarization, and political disinformation: A review of the scientific literature*. Hewlett Foundation. http://dx.doi.org/10.2139/ssrn.3144139

Competing interests

There are no competing interests of the authors.

Ethics

This work does not involve any human subjects. WhatsApp Monitor does not store any sensitive data.

Data availability

All materials and data needed to replicate this study are available via the Harvard Dataverse: https://doi.org/10.7910/DVN/EZJC8G.