

**Codebook**  
**Mapping Political Elites COVID-19 Vaccine Tweets in Brazil in 2020**

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## **I. Introduction**

This codebook summarizes the data collection and coding stages employed in developing the *Political Elites COVID-19 Vaccine Sentiment on Twitter 2020 in Brazil* dataset. The dataset aims to provide readers with detailed information about Brazilian political elites' participation in debates surrounding the themes of COVID-19 vaccines and vaccination through Twitter.

The codebook is divided into three main sections: the first section delineates processes undertaken to build the *Political Elites Dataset*; the second section is devoted to characterizing the development of the *COVID-19 Tweet Classification Strategy*. Finally, the third section presents detailed descriptions of all the variables in the compiled dataset.

The section devoted to the *Political Elites Dataset* encompasses four subsections: Candidate Data including Party Affiliation; Classification of Party; Classification of Party Aligned with Bolsonaro; Classification of Bolsonaro Allies; and Twitter ID Retrieval. The dataset aims to provide detailed information on candidates, including party affiliation, ideological positioning and information about active and inactive Twitter profiles.

The *COVID-19 Tweet Classification Strategy* section comprises six subsections, including Pre-Processing Rules, Keywords, Relevant Classification, Stance Classification, Mandatory Classification, and Sentiment Classification. This section of the codebook aims to describe and discuss in detail the steps taken to collect and categorize candidate tweets.

The third and final section provides detailed information about other variables such as date, likes, retweets, epidemiological week, mandatory, brands and descriptions of all the variables in the dataset with details about coding processes.

## **II. Political Elites Dataset**

The *Political Elites Dataset* was designed to include detailed information regarding mayoral candidates that participated in the 2020 municipal elections in Brazil. Using the data recorded by the Superior Electoral Court (TSE),<sup>1</sup> we compiled a comprehensive list of all the mayoral candidates who participated in the 2020 elections across the 26 state capitals of Brazil.

Among the 323 candidacies presented in these municipalities, the TSE accepted 300 candidates. The remaining 23 candidates either resigned their candidacies or were rejected by the court. On average, about 12 candidates participated in the elections in each municipality. Rio Branco (AC) had the lowest number of candidacies, with only seven competitors at the election time, while Belo Horizonte (MG), Curitiba (PR), and Porto Velho (RO) emerged as the capitals with the highest number of candidates, each boasting a total of 15 contenders. Table 1 portrays the number of approved candidacies by the TSE in the 26 Brazilian state capitals.

**Table 1.** Number of Mayoral Candidates in the 2020 Elections by City

State	City	Number of candidates
AC	Rio Branco	7
AL	Maceió	10
AM	Manaus	11
AP	Macapá	10
BA	Salvador	9
CE	Fortaleza	10
ES	Vitória	13
GO	Goiânia	14
MA	São Luís	10
MG	Belo Horizonte	15
MS	Campo Grande	13
MT	Cuiabá	8

<sup>1</sup> Tribunal Superior Eleitoral (the electoral court of all Brazilian elections). The website can be accessed in: <https://www.tse.jus.br/#/>

PA	Belém	12
PB	João Pessoa	14
PE	Recife	9
PI	Teresina	12
PR	Curitiba	15
RJ	Rio de Janeiro	13
RN	Natal	13
RO	Porto Velho	15
RR	Boa Vista	10
RS	Porto Alegre	11
SC	Florianópolis	10
SE	Aracaju	11
SP	São Paulo	13
TO	Palmas	12

### Candidate Biographical Data

For all the candidacies approved by the TSE, we collected information regarding the electoral district, sociodemographic characteristics, party affiliation, and electoral performance. Candidates were categorized based on their name, gender, party and coalition membership, and the state and city where they contested the elections.

Electoral performance data includes i) votes by candidate in the first and, second rounds;<sup>2</sup> ii) a dichotomous variable indicating whether a candidate disputed the second round of election (1 is attributed to cases where the candidate disputed the second round of elections); iii) a dichotomous variable indicating whether the

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<sup>2</sup> In Brazilian municipal elections, candidates win in the first round if they gather 50%+1 votes. In cases where no candidate accumulates enough votes, a second round is performed, including only the two best positioned candidates in the first round.

candidate won the election (1 if winner); iv) for winning candidates, the margin of victory, and, v) a dichotomous variable identifying incumbents (1 if incumbent).

### Classification of Party Alignment with Bolsonaro

To measure the positions of parties about the Bolsonaro's government, we decide to construct a government/opposition measure using the data provided by "Radar do Congresso"<sup>3</sup>. This data measures the votes of each parliamentary in the Legislative Chamber (first house) and Senate (second house). With this, they obtained a mean for the parliamentarians' votes of each party and compared with the position of Bolsonaro's government.

This results in a percentage of "governmentism" for each party, from 0% to 100%, that indicates how many times the parliamentarians of a party had similar positions with the Bolsonaro's government positions in the Congressional voting.

Following this classification for each party with Congressional representation between 2019 and 2020, constructed by the "Radar do Congresso"<sup>4</sup>, we decide to divide into groups based on the percentage of each party. A government party voted with Bolsonaro's government with more than 80% of the legislative votes. A neutral party voted with the government between 50% and 80% of the time. An opposition party voted with the government less than 50% of the legislative votes.

The table below shows the party classification from the government position.

**Table 2.** Party's Position with respect to Government

Party	Government/Opposition Position
PSL (97%), Patriota (94%), DEM (93%), PSC (93%), NOVO (92%), PSDB (92%), MDB (91%), PP (91%), Republicanos (91%), PL (90%), PSD (90%), PTB (90%),	Government Party

<sup>3</sup> "Radar do Congresso" is a production of the "Congresso em Foco" with financial support from Google. The website can be accessed here: <https://radar.congressoemfoco.com.br/parlamentares/senado>. During the Bolsonaro's government (2019-2023) they used the data to produce analyses of governmentism. Now, the website contains just information about the Lula's government (2023-), but varies analyses can be accessed in the Congresso em Foco website: <https://congressoemfoco.uol.com.br/>

<sup>4</sup> We used the information published in this article to classified the parties into group of governmentism, considerer the percentage of similar votes with the Bolsonaro's government: <https://congressoemfoco.uol.com.br/area/governo/exclusivo-os-12-partidos-que-formam-a-base-fi-el-do-governo-na-camara/>

SD (89%) and Cidadania (87%).	
Podemos (77%), Pros (75%), Avante (74%) and PV (68%)	Neutral Party
PDT (48%); PSB (46%); Rede (36%); PCdoB (29%); PT (20%) and PSOL (15%)	Opposition Party

### Classification of Bolsonaro's Candidates Allies

We classified candidates' alignment with president Jair Bolsonaro during the election campaign period in 2020. To determine the alignment of candidates with President Jair Bolsonaro in relation to political and ideological positions, two distinct variables were created: "*endorse\_president*" and "*align\_president*".

For both variables, social media (Twitter, Facebook, and Instagram), news sites, and interviews of all candidates were consulted. All posts made during 2020 were verified. Using Google's search engine, we also searched for the names of the candidates and keywords such as "is supported by the president/Bolsonaro" or "supports/is aligned with the president/ Bolsonaro."

The variable "*endorse\_president*", refers to candidates who Bolsonaro publicly endorsed during the 2022 mayoral elections campaign. These candidates received official support from Bolsonaro in either television, radio, social networks, or other mass media endorsements.

Of the 300 candidacies presented, only 11 candidates, spanning across different parties, received endorsements from Jair Bolsonaro. With the exception of Sebastião Bocalom (PP/Rio Branco-AC), all candidates endorsed by the former president were defeated at the polls.

The variable "*align\_president*", refers to those candidates who, despite not receiving formal endorsement from Bolsonaro during the 2020 campaign, declared that, if elected, they would govern following the policies and guidelines adopted at the national level by Bolsonaro. Only candidates who declared themselves aligned with the Bolsonaro government were classified as such.

Among the candidates who expressed alignment with Jair Bolsonaro, but did not receive his official endorsement, we identified 48 individuals who based their campaigns on the former president's ideology and an additional 11 who he endorsed. These 59 candidates, which were either aligned with or supported by the

former president, utilized Bolsonaro's image during the 2020 elections as part of their campaigns. Table 3 summarizes the candidates who supported or aligned with Jair Bolsonaro in the 2020 municipal elections.

**Table 3.** Candidates Endorsed\* or Aligned with Jair Bolsonaro in the 2020 Municipal Elections

State	City	Candidate supported or aligned with Bolsonaro (Party)
AC	Rio Branco	Roberto Duarte (MDB)* Sebastião Bocalom (PP)*
AL	Maceió	Josan Leite (PATRIOTA)
AM	Manaus	Capitão Alberto Neto (REPUBLICANOS) Coronel Menezes (PATRIOTA)* Chico Preto (DC) Romero Reis (NOVO)
AP	Macapá	Cirilo Fernandes (PRTB) Guaracy Júnior (PSL) Haroldo Iram (PTC) José Alcolumbre (DEM)* Patrícia Ferraz (PODE)
BA	Salvador	César Leite (PRTB)
CE	Fortaleza	Heitor Freire (PSL) Capitão Wagner (PROS)*
ES	Vitória	Halpher Luiggi (PL) Delegado Pazolini (REPUBLICANOS) Capitão Assunção (PATRIOTA)
GO	Goiânia	Gustavo Gayer (DC) Major Araújo (PSL) Vanderlan Cardoso (PSD)
MA	São Luís	Eduardo Braide (PODE) Sílvio Antônio (PRTB)
MG	Belo Horizonte	Bruno Engler (PRTB)* Lafayette Andrada (REPUBLICANOS)
MT	Cuiabá	Roberto França (PATRIOTA)*



PA	Belém	Delegado Federal Eguchi (PATRIOTA)* Guilherme Lessa (PTC) Vavá Martins (REPUBLICANOS)
PB	João Pessoa	Nilvan Ferreira (MDB) Wallber Virgolino (PATRIOTA)
PE	Recife	Coronel Feitosa (PSC) Mendonça Filho (DEM) Delegada Patrícia (PODE)*
PI	Teresina	Major Diego Melo (PATRIOTA)
PR	Curitiba	Fernando Francischini (PSL) Zé Boni (PTC) Marisa Lobo (AVANTE)
RJ	Rio de Janeiro	Luiz Lima (PSL) Marcelo Crivella (REPUBLICANOS)*
RN	Natal	Coronel Azevedo (PSC) Coronel Hélio Oliveira (PRTB) Delegado Leocádio (PSL)
RO	Porto Velho	Sargento Eyder Brasil (PSL)
RR	Boa Vista	Antônio Nicoletti (PSL) José Ottaci (SOLIDARIEDADE)
RS	Porto Alegre	Gustavo Paim (PP)
SC	Florianópolis	Alexander Brasil (PRTB) Hélio Bairros (PATRIOTA)
SE	Aracaju	Delegada Danielle (CIDADANIA) Georlize Oliveira (DEM) José Almeida (PRTB) Lúcia Flávio (AVANTE) Delegado Paulo Márcio (DC) Rodrigo Valadares (PTB)
SP	São Paulo	Celso Russomanno (REPUBLICANOS)*
TO	Palmas	Eli Borges (SOLIDARIEDADE) Gil Barison (REPUBLICANOS) Dr. Joaquim Rocha (PMB)

**Notes:** \* These are the candidates who were formally supported by former President Jair Bolsonaro.

The average number of candidates declaring alignment with Jair Bolsonaro in each municipality was about two. Among them, the municipality of Aracaju (SE) stood out with the highest number of candidates linked to the former president, totaling six competitors in 2020. Interestingly, the municipality of Campo Grande (MS) was the only one in the sample with no candidate aligned with Bolsonaro.

#### 2020 Electoral Results of Candidates

Information was collected about the winning candidate in each capital of the sample (*electoral\_result*), whether the candidate had won in the first or second round (*disputed\_second\_round*), the respective margin of victory (*margin\_victory\_candidate*) and if a candidate was the incumbent mayor (*incumbent*). In the 2020 elections, 7 of 26 mayors received a majority share in the first round and therefore did not have to face a runoff second round. Table 4 shows the winner for each capital, the round of victory and the margin of victory between the first and second place for candidates in the 26 state capitals.

**Table 4.** Municipal Elections Winners and Margins of Victory (2020)

State	City	Name of Elected Mayor (Party)	Round of Victory	Margin of Victory between 1st and 2nd place
AC	Rio Branco	Sebastião Bocalom (PP)	2	25.86%
AL	Maceió	João Henrique Caldas (PSB)	2	17.27%
AM	Manaus	David Almeida (AVANTE)	2	2.55%
AP	Macapá	Antônio Furlan (CIDADANIA)	2	11.34%
BA	Salvador	Bruno Reis (DEM)	1	45.34%
CE	Fortaleza	José Sarto (PDT)	2	3.38%
ES	Vitória	Lorenzo Pazolini (REPUBLICANOS)	2	17.00%
GO	Goiânia	Luiz Maguito Vilela (MDB)	2	5.21%

MA	São Luís	Eduardo Braide (PODE)	2	11.06%
MG	Belo Horizonte	Alexandre Kalin (PSD)	1	53.41%
MS	Campo Grande	Marcos Trad (PSD)	1	50.06%
MT	Cuiabá	Emanuel Pinheiro (MDB)	2	2.29%
PA	Belém	Edmilson Rodrigues (PSOL)	2	3.53%
PB	João Pessoa	Cícero Lucena (PP)	2	6.33%
PE	Recife	João Campos (PSB)	2	12.54%
PI	Teresina	José Pessoa (MDB)	2	24.63%
PR	Curitiba	Rafael Greca (DEM)	1	46.48%
RJ	Rio de Janeiro	Eduardo Paes (DEM)	2	28.14%
RN	Natal	Álvaro Dias (PSDB)	1	42.20%
RO	Porto Velho	Hildon Chaves (PSDB)	2	8.90%
RR	Boa Vista	Arthur Henrique (MDB)	2	70.72%
RS	Porto Alegre	Sebastião Melo (MDB)	2	9.26%
SC	Florianópolis	Gean Loureiro (DEM)	1	35.33%
SE	Aracaju	Edvaldo Filho (PDT)	2	15.71%
SP	São Paulo	Bruno Covas (PSDB)	2	18.76%
TO	Palmas	Cíntia Ribeiro (PSDB)	1	21.73%

If we consider all the incumbent candidates (candidates serving their first terms as mayor during the 2020 elections), the number of incumbents is 13, with 10 of them reelected to a second term. These candidates are identified by a dichotomous incumbent variable (0 for candidates not seeking reelection and 1 for candidates pursuing a second term). The incumbents seeking reelection and the outcome of the 2020 election are listed in Table 5.

**Table 5.** Incumbent Mayors seeking Reelection and 2020 Re-election Outcomes

State	City	Name of the Incumbent (Party)	Electoral Result
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AC	Rio Branco	Maria do Socorro Neri (PSB)	Not reelected
MG	Belo Horizonte	Alexandre Kalil (PSD)	Reelected
MS	Campo Grande	Marcos Trad (PSD)	Reelected
MT	Cuiabá	Emanuel Pinheiro (MDB)	Reelected
PR	Curitiba	Rafael Greca (DEM)	Reelected
RJ	Rio de Janeiro	Marcelo Crivella (REPUBLICANOS)	Not reelected
RN	Natal	Álvaro Dias	Reelected
RO	Porto Velho	Hildon Chaves (PSDB)	Reelected
RS	Porto Alegre	Nelson Marchezan Júnior (PSDB)	Not reelected
SC	Florianópolis	Gean Loureiro (DEM)	Reelected
SE	Aracaju	Edvaldo Filho (PDT)	Reelected
SP	São Paulo	Bruno Covas (PSDB)	Reelected
TO	Palmas	Cíntia Ribeiro (PSDB)	Reelected

### Bolsonaro 2018 Electoral Results

The *Political Elites Dataset* further includes information about the electoral results, for each capital, obtained by elected president Jair Bolsonaro in the 2018 presidential elections. While a dichotomous variable (*bolsonaro\_municipality\_victory*) is employed to signalize Bolsonaro's victory in a particular location, the respective margins of victory in the second round of elections (*margin\_victory\_bolsonaro*) are also included in the dataset<sup>5</sup>. Table 6 exhibits 2018 electoral results, and the respective margins of victory (or defeat) for Bolsonaro in all Brazilian state capitals.

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<sup>5</sup> The 2018 presidential election was decided in the second round. The candidate defeated was Fernando Haddad (PT). In the first round, Bolsonaro, in the first position, had 46.03% of votes, followed by Haddad which had 29.28%. In the second round, Bolsonaro won after having 55.13% of votes against 44.87% of Haddad.

**Table 6.** Electoral Results and Victory Margins in the 2nd round for Jair Bolsonaro in the 2018 Presidential Elections for all state capitals

State	City	2nd Round Margin	Bolsonaro 2018 Electoral Result
AC	Rio Branco	65.54%	Won
AL	Maceió	23.26%	Won
AM	Manaus	31.44%	Won
AP	Macapá	10.30%	Won
BA	Salvador	-37.18%	Lost
CE	Fortaleza	-11.22%	Lost
ES	Vitória	26.38%	Won
GO	Goiânia	48.40%	Won
MA	São Luís	-15.56%	Lost
MG	Belo Horizonte	31.18%	Won
MS	Campo Grande	42.54%	Won
MT	Cuiabá	33.88%	Won
PA	Belém	9.86%	Won
PB	João Pessoa	9.60%	Won
PE	Recife	-5.00%	Lost
PI	Teresina	-25.46%	Lost
PR	Curitiba	53.08%	Won
RJ	Rio de Janeiro	32.70%	Won
RN	Natal	5.96%	Won
RO	Porto Velho	37.88%	Won
RR	Boa Vista	57.22%	Won
RS	Porto Alegre	13.70%	Won
SC	Florianópolis	29.72%	Won
SE	Aracaju	-5.52%	Lost

SP	São Paulo	20.76%	Won
TO	Palmas	29.76%	Won

Considering the 26 state capitals, Bolsonaro received the majority vote share in 20 capitals and lost in 6 others in the 2nd round of the 2018 election. The margin of victory in the municipalities he won varied from 65.54% in Rio Branco to 5.96% in Natal. In the municipalities he lost, the loss margin varied from -37.18% in Salvador to -5.00% in Recife.

### Twitter ID Retrieval

Based on data registered in the TSE (Superior Electoral Court), a list of all candidates running for mayor positions in the 2020 elections in the 26 state capitals of Brazil was used to locate active Twitter accounts used by these candidates within the research period. Of the 300 candidates, we could not identify a Twitter account for 57 of these candidates.

**Table 7.** Mayoral candidates in 2020 from the 26 state capitals with and without active Twitter accounts

State	City	Candidates with active Twitter accounts	Candidates without Twitter accounts
AC	Rio Branco	Tião Bocalom; Daniel Zen; Jamyl Asfury; Minoru Kinpara; Roberto Duarte; Socorro Neri	Belcladio Jarbas Soster
AL	Maceió	Alfredo Gaspar de Mendonça; Corinθο Campelo; Cicero Filho; Davi Davino Filho; Jhc; Lenilda Luna; Valeria Correia; Ricardo Barbosa	Josan Leite Pereira Barros; José Cícero Soares de Almeida
AM	Manaus	Amazonino Mendes; Capitão Alberto Neto; Coronel Menezes; Chico Preto; David Almeida; Marcelo Amil; Ricardo Nicolau; Romero Reis; Alfredo Nascimento; Zé Ricardo	Gilberto Vasconcelos da Silva

AP	Macapá	Cirilo Fernandes; Dr. Furlan; Haroldo Iram; Josiel; Patrícia Ferraz; Paulo Lemos; Gianfranco; Professor Marcos	João Alberto Rodrigues Capiberibe; Guaracy Batista da Silveira Júnior
BA	Salvador	Bruno Reis; Rodrigo Pereira; Celsinho Cotrim; Cezar Leite; Bacelar; Hilton Coelho; Major Denice; Olívia; Pastor Sargento Isidório	-
CE	Fortaleza	Capitão Wagner; Célio Studart; Paula Colares; Heitor Férrer; Heitor Freire; Luzianne Lins; Anizio; Renato Roseno; Sarto	Samuel Moraes Braga
ES	Vitória	Capitão Assunção; Coronel Nylton; Gandini; João Coser; Mazinho; Namy Chequer; Neuzinha; Sergio Sá	Eron Domingos Souza Lima; Gilberto Batista Campos; Halpher Luiggi Monico Rosa; Lorenzo Silva de Pazolini; Raphael Góes Furtado
GO	Goiânia	Delegada Adriana Accorsi; Alysson Lima; Major Araújo; Elias Vaz; Fábio Junior; Gustavo Gayer; Maguito Vilela; Manu Jacob; Samuel Almeida; Talles Barreto; Vanderlan Cardoso; Virmondes Cruvinel	Antônio Vieira Neto; Cristiano de Moraes Cunha
MA	São Luís	Bira; Duarte; Eduardo Braide; Hertz Dias; Jeisael; Neto Evangelista; Professor Franklin; Rubens Junior; Silvio Antonio; Yglésio Moyses	-
MG	Belo Horizonte	Alexandre Kalil; Áurea Carolina; Luisa Barreto; Bruno Engler; Fabiano Cazeca; João Vitor Xavier; Lafayette Andrada; Marcelo Souza e Silva; Marília Domingues; Nilmário Miranda; Rodrigo Paiva; Wadson Ribeiro; Wanderson Rocha; Professor Wendel Mesquita; Cabo Xavier	-
MS	Campo Grande	Dagoberto; Márcio Fernandes; Esacheu Nascimento; Guto Scarpanti; João Henrique; Marcelo Bluma; Marquinhos Trad; Vinícius Siqueira; Paulo Matos; Pedro Kemp	Cristiane Pinheiro Duarte; Ednei Marcelo Miglioli; Sidnéia Catarina Tobias

MT	Cuiabá	Aécio Rodrigues; Gilberto Lopes Filho; Emanuel Pinheiro; Paulo Henrique Grando; Gisela Simona	Abilio Jacques Brunini Moumer; Julier Sebastião da Silva; Roberto França Auad
PA	Belém	Cássio Andrade; Cléber Rabelo; Delegado Federal Eguchi; Thiago Araújo; Edmilson Rodrigues; Gustavo Sefer; Priante; Vavá Martins	José Jerônimo de Sousa; Luiz Guilherme Lessa de França; Jair Lopes Correia; Mário Couto Filho
PB	João Pessoa	Anísio Maia; Camilo Duarte; Cícero Lucena; Edilma Freire; Ítalo Guedes; Nilvan Ferreira; Raoni; Ricardo Coutinho; Ruy Carneiro; Wallber Virgolino	Carlos Antônio Araújo Monteiro; João Almeida de Carvalho Junior; Rafael Freire Santana; Severina dos Ramos Silva Dantas
PE	Recife	Cláudia Ribeiro; Coronel Feitosa; João Campos; Marília Arraes; Mendonça Filho	Carlos Antonio Gomes de Andrade Lima; Charbel Elias Maroun; Patricia de Oliveira Domingos; Thiago de Oliveira Santos
PI	Teresina	Dr. Pessoa; Fábio Novo; Fábio Abreu; Gessy Fonseca; Fábio Sérvio; Gervásio Santos; Kleber Montezuma; Lucineide Barros; Major Diego Melo; Major Rogério	Pedro Laurentino Reis Pereira; Simone Pereira de Farias Araujo
PR	Curitiba	Camila Lanes; Christiane Yared; Dr. João; Guilherme do Novo; Eloy Casagrande; Fernando Francischini; Goura; João Arruda; Letícia Lanz; Marisa Lobo; Professor Mocellin; Paulo Opuszka; Rafael Greca; Zé Boni	Caroline Arns de Santa Cruz Arruda; Samara Garrantini
RJ	Rio de Janeiro	Cyro Garcia; Benedita da Silva; Delegada Martha Rocha; Clarissa Garotinho; Eduardo Paes; Glória Heloiza; Marcelo Crivella; Bandeira de Mello; Paulo Messina; Luiz Lima; Renata Souza; Fred Luz; Suêd Haidar	-
RN	Natal	Álvaro Dias; Coronel Azevedo; Carlos Alberto (Beto); Coronel Hélio Oliveira;	Afrânio Ferreira de Miranda Filho;



		Hermano Moraes; Kelps Lima; Delegado Leocádio; Nevinha Valentim; Jaidy Oliver; Rosália Fernandes; Senador Jean	Fernando Carvalho de Freitas
RO	Porto Velho	Leonel Bertolin; Dr. Breno Mendes; Hildon Chaves; Sargento Eyder Brasil; Ramon Cujui; Vinícius Miguel	Cristiane Lopes da Luz Bernarros; Edvaldo Rodrigues Soares; Geneci Gonçalves dos Santos; Leonardo Severo da Luz Neto; Lindomar Barbosa Alves; Mauro Ronaldo Flores Correa; Nascimento Antônio da Silva; Samuel Costa Menezes; Williames Pimentel de Oliveira
RR	Boa Vista	Arthur Henrique; Nicoletti; Shéridan; Fábio Almeida; Gerlane; Linoberg; Luciano Castro; Ottaci	Isamar Pessoa Ramalho; Shaolyn Gomes Bezerra
RS	Porto Alegre	Fernanda Melchionna; Gustavo Paim; João Derly; Juliana Brizola; Julio Flores; Manuela; Nelson Marchezan Júnior; Rodrigo Maroni; Montserrat Martins; Sebastião Melo; Valter	-
SC	Florianópolis	Alexander Brasil; Angêla Amin; Dr. Ricardo; Gabriela Santetti; Gean Loureiro; Orlando; Pedrão; Professor Elson	Helio Cesar Bairros; Jair Fernandes de Aguiar Ramos
SE	Aracaju	Alexis Pedrão; Delegada Danielle; Almeida Lima; Rodrigo Valadares; Edvaldo; Georlize; Juraci Nunes; Márcio Macedo; Delegado Paulo Márcio	Gilvani Alves dos Santos; Lúcio Flávio Miranda da Rocha
SP	São Paulo	Andrea Matarazzo; Arthur do Val Mamãe Falei; Bruno Covas; Celso Russomanno; Guilherme Boulos; Jilmar Tatto; Joice Hasselmann; Levy Fidelix; Marcio França; Marina Helou; Orlando Silva; Vera	Antônio Carlos Silva
TO	Palmas	Alan Barbiero; Barison; Cinthia Ribeiro; Eli Borges; Professor Bazolli; Marcelo Lelis; Professor Júnior Geo; Thiago Amastha	João Helder Vilela; Joaquim Rocha Pereira; Max Dornellys Borges

		Andrino; Vanda Monteiro	de Oliveira
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### III. COVID-19 Tweet Classification

#### Pre-Processing Rules

Among the 243 candidates who had active Twitter accounts, a total of 224 candidates posted content in the year 2020. Through the utilization of the Python library Twarc, we gathered a comprehensive collection of 231,770 posts from these 224 candidates between January 1st and December 31st, 2020. Twarc<sup>6</sup> is a tool that facilitates the collection of Twitter data through the Twitter API. Each line in our dataset represents a unique Tweet by a specific candidate on a given date. For each tweet, we collected the link, content (including images, videos and links), the date and time, and the number of likes, retweets and quote tweets associated with each post.

#### Keywords

Keywords were used for data collection by specific subjects and terms. Initially, 79 terms related to COVID-19 vaccines and vaccination were included. The list comprises terms related to vaccination, immunization, vaccine brands and laboratories responsible for developing and distributing vaccines, clinical trials, and vaccine policies.<sup>7</sup> Alternative spelling was considered in an effort to capture possible spelling mistakes.<sup>8</sup> Both upper and lower cases were used for each term.

Additionally, after the manual classification of the entire sample, 13 terms were added to the list of keywords, due to the recognition of their relevance in the debate associated with COVID-19 vaccination.

Most of these terms were observed in tweets with negative sentiments about COVID-19 vaccines and posted by five candidates - Alexander Brasil (PRTB);

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<sup>6</sup> Summers, E.: edsu/twarc (2013). doi:10.5281/zenodo.17385. <https://github.com/edsu/twarc>.

<sup>7</sup> The original R script used in the filtering process is available upon request.

<sup>8</sup> We are well aware the terms included in this analysis do not exhaust all the possibilities. The most common variations were selected, however, for practical purposes.

Capitão Assunção (PATRIOTA); Cezar Leite (PRTB); Fred Luz (NOVO); Marisa Lobo (AVANTE). These terms include: ‘*DoriaVac*’ and ‘*Va-china*,’ which are intended to associate the COVID-19 vaccine with a specific political leader or country. Moreover, terms commonly used by then President Jair Bolsonaro, while mentioning or referring to vaccines and vaccination in interviews, official speeches and social media posts (e.g., *cobaia* (guinea pig) and *jacaré[e]* (alligator)) were similarly included. Table 8 summarizes the final corpus of 92 words in Brazilian Portuguese.

**Table 8.** COVID-19 Vaccine and Vaccination Keywords

Topic	Keywords
Vaccines and Vaccination - general references	[Vv]acin; [Vv]assina; [Vv]acinacao [Vv]asina; [li]munização; [li]munisação; Vaccine Symbol (0)
Covid-19 Vaccines and Laboratories	CoronaVac - [Cc]orona[Vv]ac; [Cc]omuna[Vv]ac; [Ss]inovac AstraZeneca - [Aa]stra[Zz]eneca; [Aa]stra[Zz]enica; [Oo]xford; [Oo]xfort; [Oo]xfor; [Vv]axzvia Pfizer - [Pp]fizer; [Pp]eizer; [Pp]pfaizer; [Ff]aizer; [Ff]eizer; [Bb]iontech; [Bb]iontec; [Cc]omyrnaty; [Cc]omimaty; [Bb]iontech [Mm]anufacturing [Gg]mbh; Moderna - [Vv]acina da [Mm]oderna; [Vv]acina [Mm]oderna; [Ss]pikevax; [Mm]oderna [Bb]iontech; mRNA-1273; CX-024414 Sputnik - [Ss]putnik; [Ss]putinik; [Ss]putink; [Ss]putinic; [Ss]putinikV; [Gg]amaleya; [Gg]amaleia Janssen - [Jj]ansen; [Jj]anssen; [Jj]&[Jj]: [Jjohnson & [Jjohnson: [Jj]honson & [Jj]honson: [Jj]onson: [Jj] & [Jj]: [Jjohnson: [Jj]johnsons; [Jj]honson; [Jj]ancen; [Aa]d26.COV2S Covaxin - [Cc]ovaxin; [Cc]ovachin; [Bb]harat [Bb]iotech Novavax - [Nn]ovavax; [Cc]ovavax; [Nn]uvaxovid; NVX-CoV2373; TAK-019; SARS- CoV-2 rS with Matrix-M1 adjuvant; [Ss]erum [li]nstitute of [li]ndia; [Nn]ovavax; [Ff]ormulation

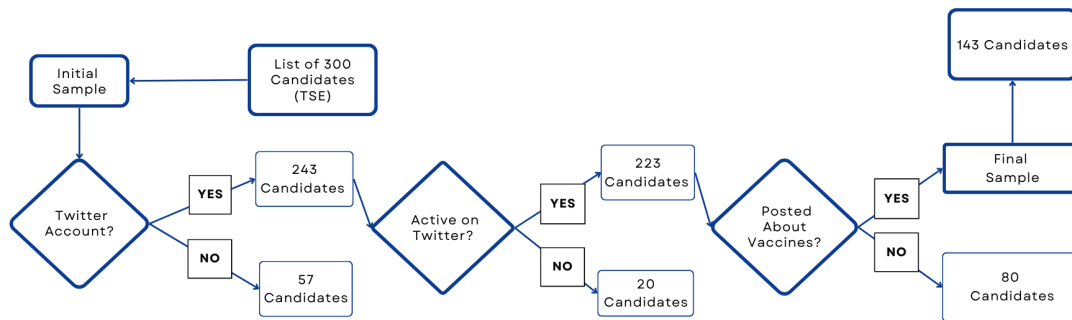
	Sinopharm - [Ss]inopharm; BIBP; [Ss]inofarm Other Laboratories - [Bb]utantan; [Bb]utanta; [Ff]iocruz; @fiocruz; [Ff]iocrus
Geographic-specific terms	[Vv]achina; [Vv]axina; [Vv]acina da [Cc]hina; [Vv]acina [Cc]hinesa; [Vv]acina [Bb]ritânica; [Vv]acina [Cc]ubana; [Vv]acina [Rr]ussa; [Vv]acina da [Rr]ussia
Additional Terms	[Dd]oriavac; [Cc]obaia; [Jj]acaré; [Jj]acare; [Dd]itadória; [Dd]itadoria; [Vv]a-china; [Vv]achinação; [Vv]a-chinacao; [Cc]olateral; [Ee]feito [Cc]olateral; [Oo]brigatoriedade; [Oo]brigar

Based on the specified keywords, a filtered sample of 2,335 posts published by 143 candidates was obtained. Subsequently, manual coding of the database was conducted.

Each tweet was coded by two researchers separately. Afterward, the two coding decisions were reviewed, and a final decision was made in team meetings when there was no consensus between the initial coder and the reviewer. Three preliminary rules were followed:

1. The analysis performed on the tweets was based exclusively on considering the text of the candidate's posts. Images, videos, and links were excluded and were not used to guide coding.
2. The biography or background of the candidate and other tweets sent from the account were not considered in classifying the contents of the particular tweet.
3. The tweet's text was interpreted using the rules outlined below. Ironic content was interpreted and not considered literally.

**Figure 1. Candidates whose Tweets were identified as Relevant to COVID-19 Vaccines and Vaccinations**



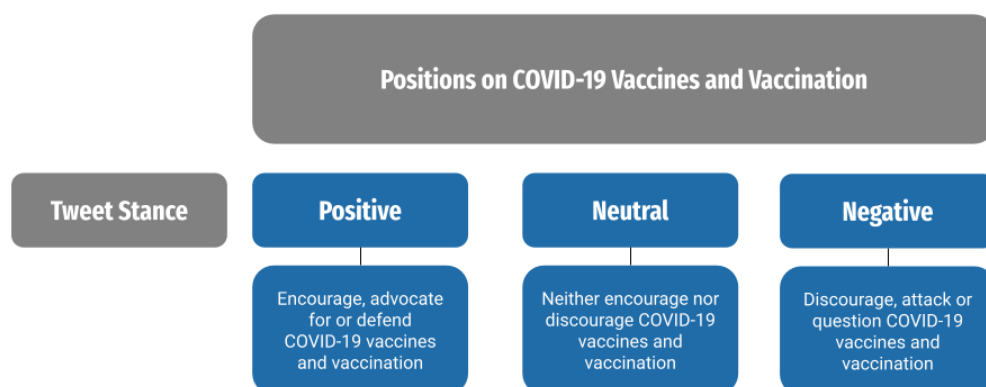
### Relevant Tweets

Departing from the corpus composed of 2,335 Twitter posts selected using the list of keywords, the coders identified posts that contained keywords but did not refer to COVID-19 vaccines or vaccination. Posts in which the contents referred to COVID-19 vaccines and vaccination received a score of 1, while posts that only contained keywords, but did not address COVID-19 vaccines and vaccination received a score of 0.

### Stance

The written content of the posts was classified as belonging to one of three categories: (i) favorable; (ii) unfavorable; and, (iii) neutral towards vaccines and vaccination. Figure X summarizes the criteria employed in the classification of tweets as favorable, unfavorable, and neutral.

**Figure 2.** General Criteria of Tweet Classification



Tweets were classified as “Favorable” if they promoted COVID-19 vaccines and vaccination. These include posts that:

- a) called for the development and approval of vaccines; emphasizing the urgency and the necessity of vaccines;
- b) defended the vaccination of the population using one or all vaccines available;
- c) expressed confidence in the development of vaccines and science;
- d) informed or celebrated clinical trials, scientific breakthroughs, agreements between governments and laboratories related to vaccine development or procurement, vaccine approvals and the beginning of immunization campaigns; and,
- e) supported mandatory vaccine mandates and/or restrictions for unvaccinated.

**Figure 3.** Examples of Twitter Posts Favorable to COVID-19 Vaccines and Vaccination



The second category, “Unfavorable,” is composed of those posts that expressed unfavorable positions regarding COVID-19 vaccination and vaccines. These include posts that:

- a) criticized and/or questioned the approval, procurement and adoption of one or all vaccines and vaccinations campaigns;
- b) discouraged and/or questioned vaccine brands, efficacy and confidence in vaccines and/or clinical trials;
- c) emphasizes side effects, lack of security and/or lack of scientific basis on clinical trials or vaccine development;

- d) criticized international health organizations, such as the WHO, pharmaceutical companies and laboratories, health institutions, such as the Ministry of Health, Butantan and Fiocruz, and public regulatory health agencies, such as ANVISA;
- e) criticized and questioned the restriction of activities in the absence of mass vaccine coverage and the efficacy of social isolation to combat the spread of the virus
- f) opposed mandatory vaccination, vaccine passports, etc.

**Figure 4.** Examples of Twitter Posts Unfavorable to COVID-19 Vaccines and Vaccination

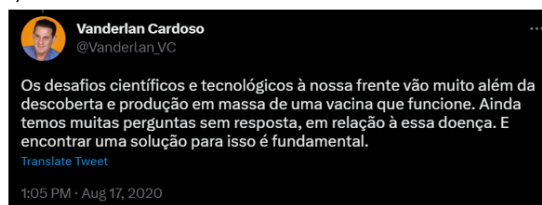


Finally, the third category, “Neutral,” comprises posts that refer to COVID-19 vaccination and/or vaccines without expressing value judgments. Posts categorized as “neutral” include tweets in which candidates did not adopt a clear position on vaccines, or vaccination. This category includes posts that:

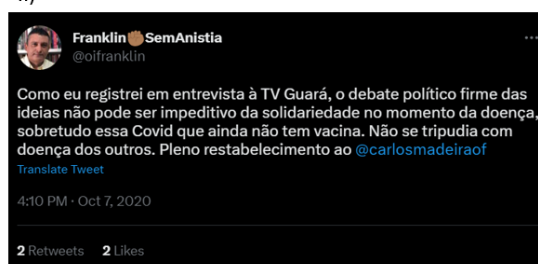
- a. publicized information on debates, events, interviews and quotes to the followers about the vaccine campaigns or the prior groups to be vaccinated;
- b. description of situations or news releases without referring to favorable or unfavorable positions.

**Figure 5.** Examples of Twitter Posts characterized as Neutral towards COVID-19 Vaccines and Vaccination

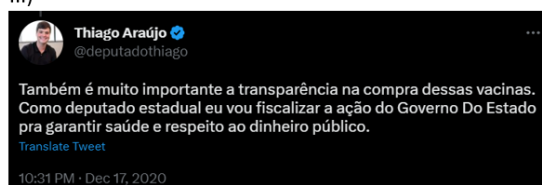
I)



II)



III)



From a total of 2,335 tweets that contain at least one of the keywords used in our searches for COVID-19 vaccines tweets, 1,600 posts by 143 candidates were manually classified as relevant to COVID-19 vaccines and vaccination. Table 9 presents the candidates who actively tweeted about the COVID-19 vaccines and vaccination in the year 2020, as well as those who did not.

**Table 9.** Candidates with active Twitter accounts who have published or not published posts related to COVID-19 vaccines and vaccinations

State	City	Candidates who published posts about Covid-19 vaccines	Candidates who have not published posts about Covid-19 vaccines
AC	Rio Branco	Daniel Queiroz (PT)	Minoru Kinpara (PSDB) Roberto Duarte (MDB) Sebastião Bocalom (PP) Socorro Neri (PSB)
AL	Maceió	João Henrique Caldas (PSB) Lenilda Luna (UP) Maria Valéria Correia (PSOL)	Alfredo Gaspar (MDB) Cícero Filho (PC do B) Corintho Campelo (PMN) Davi Davino (PP)
AM	Manaus	Amazonino Mendes (PODE) Alberto Neto (REPUBLICANOS) David Almeida (AVANTE) Elson Marcelo Lima (PC do B) José Ricardo Wendling (PT) Romero Reis (NOVO)	Alfredo Menezes (PATRIOTA) Marco Antônio da Costa (DC) Ricardo Nicolau (PSD)
AP	Macapá	Antônio Paulo Furlan (CIDADANIA)	Haroldo Iram (PTC) Paulo Lemos (PSOL)



		Gianfranco Gusmão (PSTU) José Samuel Alcolumbre (DEM) Patrícia Ferraz (PODE)	
BA	Salvador	Bruno Reis (DEM) Celso Coelho (PROS) Cézar Leite (PRTB) Denice Santiago (PT) Hilton Coelho (PSOL) João Carlos Bacelar (PODE) Olívia Santana (PC do B) Rodrigo Pereira (PCO)	-
CE	Fortaleza	Anízio Santos (PC do B) Célio Studart (PV) Heitor Férrer (SOLIDARIEDADE) Heitor Freire (PSL) José Sarto (PDT) Luizianne Lins (PT) Paula Colares (UP) Renato Roseno (PSOL)	Wagner Gomes (PROS)
ES	Vitória	João Coser (PT) Lucínio Castelo (PATRIOTA) Nylton Rodrigues (NOVO) Sérgio Sá (PSB)	Fabício Aquino (CIDADANIA) Edmar Lorencini (PSD) Neuza de Oliveira (PSDB)
GO	Goiânia	Adriana Accorsi (PT) Elias Vaz (PSB) Fábio Júnior (UP) Hemanuelle Jacob (PSOL) Júnio Araújo (PSL) Talles Barreto (PSDB) Vanderlan Cardoso (PSD)	Alysson Lima (SOLIDARIEDADE) Luiz Vilela (MDB) Samuel Almeida (PROS) Virmondes Cruvinel (CIDADANIA)
MA	São Luís	Eduardo Braide (PODE) Franklin Ferreira (PSOL) Hidelis Duarte (REPUBLICANOS) Rubens Júnior (PC do B) Sílvio Antônio (PRTB) Ubirajara Sousa (PSB) Yglésio Moysés (PROS)	Hertz Dias (PSTU) Jeisael de Jesus (REDE) José Evangelista (DEM)
MG	Belo Horizonte	Áurea Carolina (PSOL) Bruno Engler (PRTB) João Vitor Xavier (CIDADANIA) Lafayette Andrada (REPUBLICANOS) Luísa Barreto (PSDB)	Alexandre Kalil (PSD) Edmar Xavier (PMB) Marcelo de Souza (PATRIOTA) Marília Domingues (PCO)

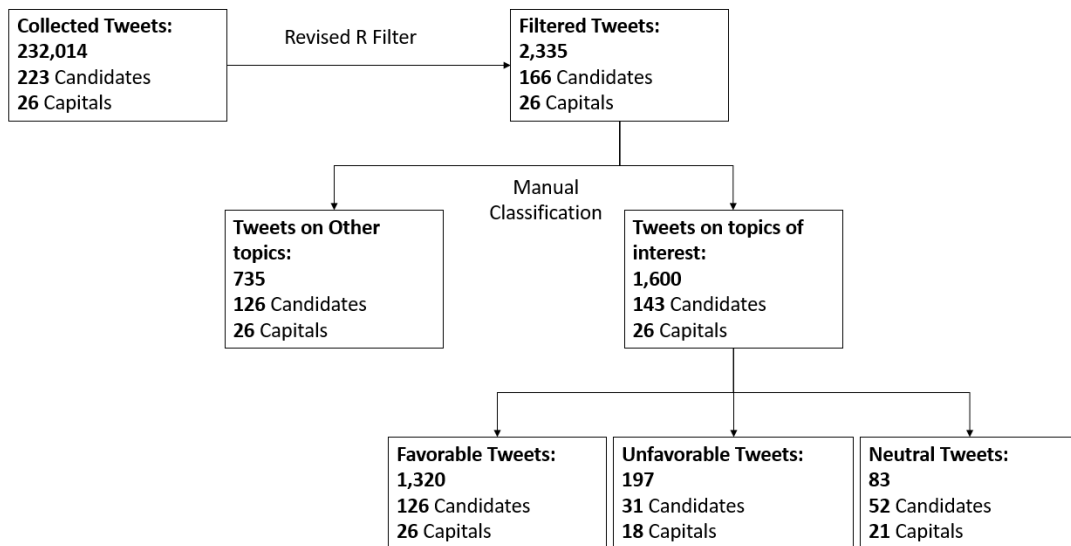
		Nilmário Miranda (PT) Rodrigo Paiva (NOVO) Wadson Ribeiro (PC do B) Wanderson Rocha (PSTU) Wendel Mesquita (SOLIDARIEDADE)	
MS	Campo Grande	Dagoberto Nogueira (PDT) Esacheu Nascimento (PP) Guto Scarpanti (NOVO) João Catan (PL) Pedro Kemp (PT) Vinícius Siqueira (PSL)	Marcelo Bluma (PV) Márcio Fernandes (MDB) Marcos Trad (PSD) Paulo Matos (PSC)
MT	Cuiabá	Emanuel Pinheiro (MDB)	Aécio Rodrigues (PSL) Gilberto Lopes (PSOL) Paulo Grando (NOVO)
PA	Belém	Edmilson Rodrigues (PSOL) Gustavo Sefer (PSD) Thiago Araújo (CIDADANIA) Wagner Martins (REPUBLICANOS)	Cássio Andrade (PSB) Everaldo Eguchi (PATRIOTA) José Priante (MDB)
PB	João Pessoa	Anísio Maia (PT) Cícero Lucena (PP) Ítalo Guedes (PSOL) Ruy Carneiro (PSDB) Wallber Virgolino (PATRIOTA)	Camilo Duarte (PCO) Edilma Freire (PV) Nilvan Ferreira (MDB) Raoni Mendes (DEM) Ricardo Coutinho (PSB)
PE	Recife	Alberto Feitosa (PSC) João Campos (PSB) Marília Arraes (PT)	José Filho (DEM)
PI	Teresina	Fábio Novo (PT) Fábio Sérvio (PROS)	Diego Melo (PATRIOTA) Fábio Abreu (PL) Gervásio Santos (PSTU) Gessy Fonseca (PSC) José Pessoa (MDB) Kleber Montezuma (PSDB) Lucineide Barros (PSOL)
PR	Curitiba	Camila Lanes (PC do B) Christiane Yared (PL) Fernando Francischini (PSL) João Arruda (MDB) João Moraes (NOVO) Jorge Brand (PDT) José Boni (PTC)	Eloy Casagrande (REDE) Renato Mocellin (PV)

		Marisa Lobo (AVANTE) Paulo Opuszk (PT) Rafael Greca (DEM)	
RJ	Rio de Janeiro	Benedita da Silva (PT) Clarissa Garotinho (PROS) Cyro Garcia (PSTU) Eduardo Paes (DEM) Frederico Luz (NOVO) Glória Silva (PSC) Luiz Lima (PSL) Marcelo Crivella (REPUBLICANOS) Martha Rocha (PDT) Paulo Messina (MDB) Renata Souza (PSOL)	Suêd Haidar (PMB)
RN	Natal	Carlos Medeiros (PV) Jaidy Oliveira (DC) Jean Prates (PT) Rosália Fernandes (PSTU)	Álvaro Dias (PSDB) André Azevedo (PSC) Hélio Oliveira (PRTB) Hermano Moraes (PSB) Kelps Lima (SOLIDARIEDADE) Maria Valentim (PSOL) Sérgio Leocádio (PSL)
RO	Porto Velho	Hildon Chaves (PSDB) Ramon Cujui (PT) Vinícius Miguel (CIDADANIA)	Breno Mendes (AVANTE) Eyder do Carmo (PSL) João Bertolin (PTB)
RR	Boa Vista	Antônio Nicoletti (PSL) Gerlane Baccarin (PP) Linoberg Almeida (REDE) Shéridan Oliveira (PSDB)	Arthur Machado (MDB) Fábio Almeida (PSOL) Luciano Castro (PL) Otaci do Nascimento (SOLIDARIEDADE)
RS	Porto Alegre	Fernanda Melchionna (PSOL) Gustavo Paim (PP) João Derly (REPUBLICANOS) Juliana Brizola (PDT) Manuel d'Ávila (PC do B) Montserrat Martins (PV) Nelson Marchezan Júnior (PSDB) Sebastião Melo (MDB) Valter Nagelstein (PSD)	Júlio Flores (PSTU)
SC	Florianópolis	Alexander Brasil (PRTB) Ângela Amin (PP) Elson Pereira (PSOL) Gean Loureiro (DEM)	Gabriela Santetti (PSTU) Pedro Silvestre (PL)

		Orlando Neto (NOVO)	
SE	Aracaju	Alexis Pedrão (PSOL) Edvaldo Filho (PDT) Márcio Macedo (PT) Rodrigo Valadares (PTB)	Danielle Soares (CIDADANIA) Georlize Teles (DEM) Juraci Nunes (PMB) Paulo Cruz (DC)
SP	São Paulo	Ângelo Matarazzo (PSD) Arthur do Val (PATRIOTA) Celso Russomanno (REPUBLICANOS) Guilherme Boulos (PSOL) Jilmar Tatto (PT) Joice Hasselmann (PSL) Márcio França (PSB) Marina Helou (REDE) Orlando Silva (PC do B) Vera Lúcia Salgado (PSTU)	Levy Fidelix (PRTB)
TO	Palmas	Alan Barbiero (PODE) Cynthia Ribeiro (PSDB) Tiago Andrino (PSB) Vanda Monteiro (PSL)	Gil Barison (REPUBLICANOS) João Bazzoli (PSOL) José Júnior (PROS) Marcelo Lelis (PV)

Overall, these 1,600 posts were identified as containing some type of positioning (favorable, unfavorable, or neutral) regarding COVID-19 vaccines and vaccination, among which 82,5% (1,320) were favorable, 12,3% (197) unfavorable, and 5,2% (83) neutral. The remaining posts (735) included the specified terms, they were related to other types of vaccines or vaccination campaigns unrelated to the Covid-19 pandemic. Figure 6 presents summary statistics for vaccine support levels.

**Figure 6.** Summary Statistics of the Process of Filtering Tweets



### Mandatory Vaccination

Tweets received a score of 1 if their content related to mandatory vaccination, and/or the implementation of vaccine passports. All other posts that didn't concern mandatory vaccination received a score of 0 in the dichotomous classification. Then, all posts that had relevance for the discussion on mandatory vaccination (posts classified previously as "1" were grouped into 3 different classifications: (i) support mandatory; (ii) contrary to mandatory and; (iii) neutral on the issue of mandatory vaccination.

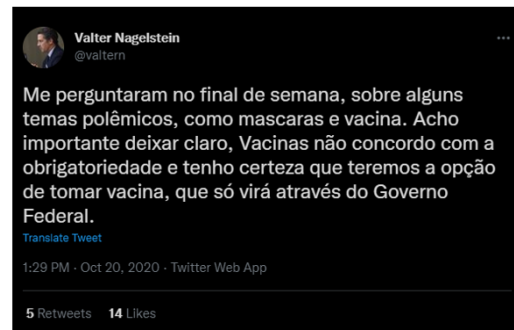
Figure X presents examples of twitter posts about mandatory vaccination for COVID-19 and Figure X presents summary statistics for vaccine support levels.

**Figure 7.** Examples of Twitter Posts regarding mandatory vaccination for COVID-19

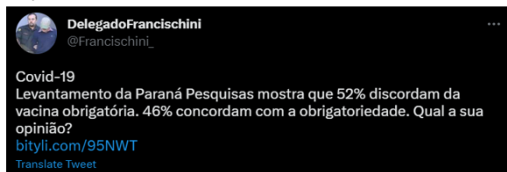
### I) Support Mandatory



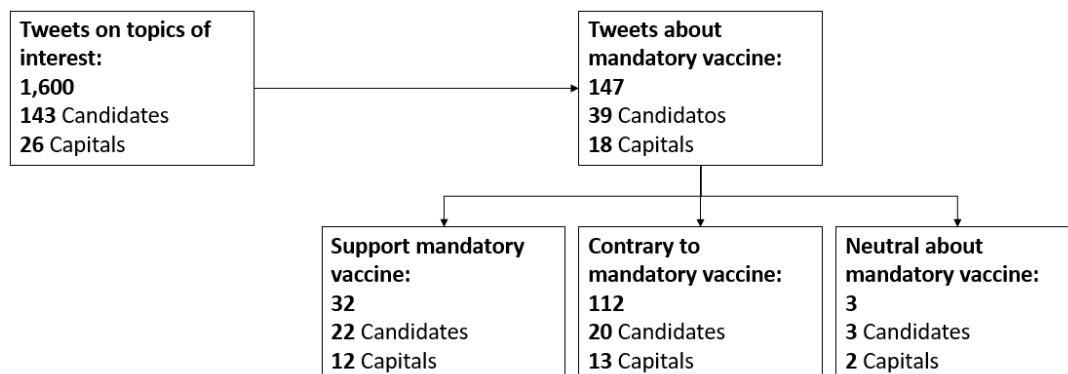
### II) Contrary Mandatory



### III) Neutral



**Figure 8.** Summary Statistics on the Distribution of Mandatory Vaccination Tweets



### Vaccine Brands

Each tweet was also coded if it referred to specific vaccine brands. Direct references (by the names of the vaccines) or indirect references (names of the producing companies, countries of origin, ironic or even xenophobic ways to referer's about vaccine brands<sup>9</sup>) were identified for the specific vaccine brand/manufacturer.

There are a total of 316 mentions of 11 different vaccine brands. As a single tweet can mention more than one vaccine brand, these mentions are present in 295 tweets. These mentioned brands (with number of mentions in parenthesis) are:

<sup>9</sup> One example of xenophobic ways to refer to a vaccine brand was using the term "vachina" to refer to Coronavac from Sinovac. In this case, the use is associated with a xenophobic distrust of the brand, because the origin country of the company which produces the vaccine.

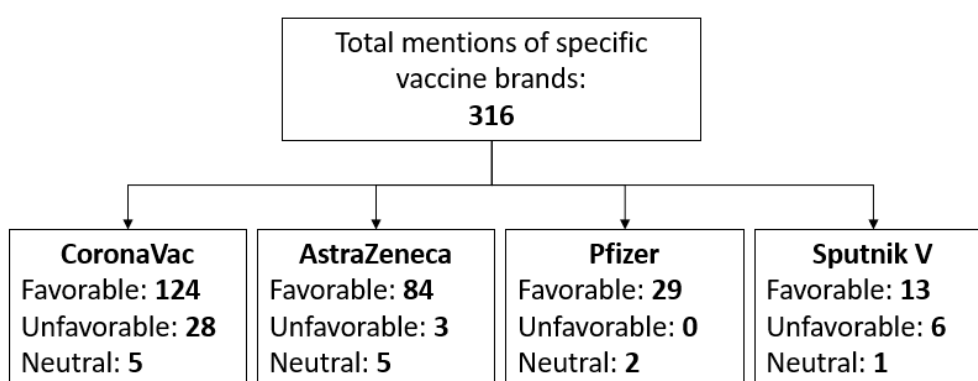
CoronaVac (124); AstraZeneca (90); Pfizer (31); Sputnik V (20); Janssen (6); Moderna (4); Soberana (4); Gamaleya (1); Curevac (1); ButanVac (1); Cansino (1).

**Figure 9.** Examples of Twitter Posts mentioning specific Vaccine Brands



Figure 10 considered the four vaccine brands that were most commonly mentioned by mayoral candidates in their tweets in 2020. Together, they represent 94.3% of the total mentions.

**Figure 10.<sup>10</sup>** Specific Vaccine Brands



<sup>10</sup> Tweets classified as unfavorable, that specifically mentioned more than one vaccine brand, had specific classification for each of the brands mentioned. This was done because there are cases that candidates made comparisons between vaccines, in which one of the vaccine brands is exalted to the detriment of the other. Thus, the mention, for example, was marked as favorable to “vaccine 1” and unfavorable to “vaccine 2”.

### Variables Description

In this section we provide an overview of all the variables included in the final dataset, along with brief content description for each variable. Variables are ordered following the order in which they appear in the dataset.

**Table 10.** Summary of Description of the variables in the data

<b>Variable</b>	<b>Description</b>
<i>date_post</i>	Numeric variable with the date of posts according to Twitter registration.
<i>author_id</i>	Numeric variable with the numeric ID associated with each candidate's profile.
<i>username</i>	String variable with the candidate's username on Twitter accounts.
<i>name_candidate</i>	String variable with the candidate's complete name.
<i>gender</i>	String variable that identifies the candidate's gender according to the TSE classification.
<i>party_id</i>	String variable with the ID of the candidate's affiliation party at the time of the elections, as stated in the TSE.
<i>followers</i>	Numeric variable with the number of followers for each active Twitter account on the day of collection, according to the Tweet log.



<i>media</i>	String variable that identifies social network originating publications <sup>11</sup> .
<i>tweet_id</i>	Numeric variable with unique numeric ID associated with each specific post.
<i>content</i>	String variable with full transcription of the textual content of the posts <sup>12</sup> .
<i>message_type</i>	Numeric variable that identifies if the post contains text, images, videos and/or links.
<i>is_quote</i>	Dummy variable that identifies if posts are 'quotes tweets' - a retweet with a reply.
<i>is_reply</i>	Dummy variable that identifies posts that are responding to other posts.
<i>is_retweet</i>	Dummy variable that identifies posts that are retweets.
<i>likes</i>	Numeric variable with the number of likes associated with individual posts on the day of collection, according to the Tweet log.
<i>quotes</i>	Numeric variable with the number of quotes associated with individual posts on the day of collection, according to the Tweet log.

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<sup>11</sup> This variable attributes a single value to all observations, as only Twitter posts were included in the dataset.

<sup>12</sup> It is worth noting that for this variable only textual content was considered, that is, no images, videos or contents of other formats were considered or included.

<i>replies</i>	Numeric variable with the number of replies associated with individual posts on the day of collection, according to the Tweet log.
<i>retweets</i>	Numeric variable with the number of retweets associated with individual posts on the day of collection, according to the Tweet log.
<i>terms</i>	String variable that list the terms present in posts that correspond to terms used in content filtering.
<i>vaccine_brand</i>	String variable that identifies vaccine brand referenced in the post.
<i>post_vaccine</i>	Dummy variable that identifies posts about vaccines and COVID-19 vaccination.
<i>positions_vac</i>	Categorical variable that identifies positions on the vaccines and COVID-19 vaccination in each post.
<i>mandatory_vaccines</i>	Dummy variable that identifies posts about mandatory COVID-19 vaccination.
<i>positions_mandatory_vaccines</i>	Categorical variable that identifies positions regarding mandatory COVID-19 vaccination in each post, according to their content.
<i>endorse_president</i>	Dummy variable that identifies candidates whom Bolsonaro publicly

	endorsed during the electoral campaign in 2020.
<i>align_president</i>	Dummy variable that identifies candidates who, despite not receiving formal endorsement from Bolsonaro in 2020 elections, declared that they, if elected, would govern following the policies and guidelines adopted by Bolsonaro at the national level.
<i>mentions_president</i>	Dummy variable that identifies the presence of references to the Federal Government and to the president in posts.
<i>president_terms</i>	String variable that list the terms present in posts that correspond to mentions of the Federal Government and/or to the president.
<i>category</i>	String variable that classifies the content of a post into theme categories.
<i>subcategory</i>	String variable that classifies the content of a post into theme subcategories referred to the previously category classification.
<i>status_url</i>	String variable for link to individual posts.
<i>hashtags</i>	String variable for list of hashtags present in posts.

<i>state</i>	String variable for federal unit for enlisting mayoral candidates.
<i>city</i>	String variable for municipality of enlistment of mayoral candidates.
<i>votes_first_round</i>	Numeric variable expressed in percentage votes received by each candidate in the first round of the 2020 municipal elections, according to TSE data.
<i>disputed_second_round</i>	Dummy variable that identifies the presence of a candidate in the second round of the 2020 municipal elections, according to TSE data.
<i>votes_second_round</i>	Numeric variable expressed in percentage votes received by each candidate in the second round of the 2020 municipal elections according to TSE data.
<i>margin_victory_candidate</i>	Numeric variable expressed in percentage that reports the difference in votes between the winner of the 2020 elections and candidates who ended in the second place in the dispute, according to TSE data.
<i>electoral_result</i>	Dummy variable that identifies candidates who were elected in the 2020 municipal elections, according to TSE data.

<i><b>incumbent</b></i>	Dummy variable that identifies incumbent candidates.
<i><b>bolsonaro_municipality_victory</b></i>	Dummy variable that identifies municipalities where Bolsonaro won the 2018 national elections, according to TSE data.
<i><b>votes_bolsonaro_second_round</b></i>	Numeric variable expressed in percentage votes for Bolsonaro in a given municipality, in the second round of the 2018 national elections, according to TSE data.
<i><b>margin_victory_bolsonaro</b></i>	Numeric variable expressed in percentage that reports the difference in votes between Bolsonaro and the second place candidate in the 2018 national elections in each municipality, according to TSE data.
<i><b>vaccine_covid_children</b></i>	Dummy variable that identifies posts about COVID-19 vaccines for children.