

Local Right-Wing Populism and Vaccination: Evidence from the COVID-19 Pandemic in Brazil

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Abstract

Despite a growing literature on the impacts of national leaders' populist stances and voters' populist attitudes, less is known about how local politicians' right-wing populism influences policy outcomes. The study focuses on the Brazilian case during the COVID-19 pandemic, where the right-populist President Jair Bolsonaro successfully employed an anti-science stance to spread skepticism towards vaccinations and social distancing measures. I use a Naïve Bayes classifier and leverage over 14,000 mayoral manifestos to present a novel measure of local-level right-wing populism. Using a close-elections regression discontinuity design, I document a significant decrease in COVID-19 vaccination rates in municipalities run by right-wing populist mayors. This effect is most likely attributable to these authorities sending mixed signals about the severity of the health crisis and exerting low effort to promote vaccination.

1 Introduction

Populist leaders frequently evoke anti-science stances to gain popularity by inflaming the population against experts, who are framed as invested in elites' vested interests (Ajzenman et al., 2023; Lasco and Curato, 2019). During the COVID-19 pandemic, many populist leaders such as Jair Bolsonaro, Donald Trump, and Narendra Modi dismissed the severity of the virus, promoted non-evidence-based therapies, and undermined campaigns for social distancing (Casarões and Magalhães, 2021; Imran and Javed, 2024; Lasco, 2020).

There is substantial evidence that voters' populist attitudes are associated with COVID-19 denial attitudes and behavior (Almeida et al., 2022; Druckman et al., 2021; Kohler

and Koinig, 2023; Peixoto et al., 2023; Recio-Román et al., 2021; Stecula and Pickup, 2021). National leader rhetoric and media can also influence citizens’ health behavior (Ajzenman et al., 2023; Hornsey et al., 2020). Likewise, local leadership was essential to implement policies to address the pandemic. For instance, female mayors in Brazil enforced more non-pharmaceutical interventions than their male counterparts (Bruce et al., 2022). Brazilian mayors who belonged to parties aligned with the federal government were also more effective at controlling COVID-19-related deaths and hospitalizations in 2021 (Fehr, 2023). Still, less is known about the potential effects of local-level populism on health policies. This paper contributes to this literature by providing causal evidence that electing a right-wing populist mayor decreased vaccination rates in the context of the COVID-19 pandemic in Brazil.

Brazil is an ideal case to study whether local right-populism affects vaccination rates. The Brazilian Unified Health System is present in all 5,570 municipalities, and approximately 75% of Brazilian citizens rely exclusively on the public health system. The Brazilian National Immunization Program has one of the most encompassing sets of vaccines free of cost in the world (Domingues et al., 2020), and the population historically trusted the National Immunization Program. In 2015, almost 93% of Brazilians believed that vaccines were important for children, the fourth-highest ranked country on this measure (Figueiredo et al., 2020). Under the right-populist presidency of Jair Bolsonaro, such trust was hurt. By 2019, during Bolsonaro’s presidency, that rate fell to 89%. In 2020, Brazil was ranked among the worst-performing countries in handling the COVID-19 pandemic (Lowy Institute, 2021). President Bolsonaro’s denial speech reduced adherence to social distancing protocols in municipalities with a higher concentration of his supporters (Ajzenman et al., 2023).

Just like some other right-wing populists, including Donald Trump, Bolsonaro adopted an anti-science stance, neglecting environmental preservation and dismissing the severity of COVID-19. He opposed social distancing measures, participated in rallies that crowded people together, spread mistrust of vaccines, and delayed the purchase of vaccines in contradiction to recommendations of the World Health Organization (WHO) and

the scientific community. In the absence of adequate federal policies to fight the pandemic, in April 2020, the Brazilian Supreme Court affirmed states' and municipalities' authority to implement non-pharmaceutical interventions (NPIs) and independently procure vaccines. However, the enactment and enforcement of NPIs and vaccination coverage varied substantially at the local level. Importantly, before mid-2022, all of the vaccines for COVID-19 were supplied by the public health system in Brazil, reducing concerns about confounders arising from decisions by private health providers.

One obstacle to this investigation is the lack of previous measures for Brazilian mayoral candidates' level of right-wing populism. I estimate these quantities using a Naïve Bayes (NB) classifier, a supervised text analysis algorithm. The resulting ideology measure is based on the posterior probability of the mayoral candidate's manifesto belonging to the populist right. Using this approach, I created an entirely new dataset with measures of ideology for more than 14,000 mayoral candidates from 33 parties and 5,459 municipalities. I provide evidence that this new measure reflects a typical left-right continuum and that it strongly and positively correlates with a previous national-level expert-based party ideology measure available from Bolognesi et al. (2022).

I further employ a close-elections regression discontinuity design to investigate the causal effect of electing a right-populist mayor on vaccination rates. My results show that the election of a right-populist mayor significantly reduces vaccination rates in Brazil by approximately 3 percentage points. The most likely explanation for this pattern is that right-populist municipal authorities exert less effort in educating citizens about the vaccination calendar and the need for a full vaccine schedule.

The paper is structured as follows. Section 2 explains the relationship between right-wing populism and health politics from a cross-country comparative perspective, leading to the research hypotheses. Section 3 presents the context of populism and handling the COVID-19 pandemic in Brazil, followed by a brief description of the institutional context. Section 4 explains the text-as-data strategy to measure local right-wing populism. Section 5 describes the data and the research design. Section 6 discusses the results. Section 7 concludes.

2 Right-Wing Populism and Health Policy in Comparative Perspective

Mudde (2004) defines populism as a thin ideology characterized by a Manichean world-view of ‘us’ against ‘them’, and the exaltation of a virtuous “people” opposed to a corrupt and self-serving elite. Therefore, populism has three main components: anti-elitism, anti-pluralism, and people-centrism (Mudde, 2004; Schäfer, 2022).

Populists frequently engage in anti-science rhetoric, particularly when experts and scientists are perceived as either co-opted by elites’ interests or as part of the elite (Ajzenman et al., 2023). Populist politicians often spread mistrust of vaccination, climate change, and health policies. The tense relationship between populism and vaccination is not unique to the COVID-19 pandemic. For example, during the 2010 H1N1 vaccination effort in the US, despite minimal rates of adverse effects, only 40% of the adult population was willing to vaccinate because of fake news about a staged pandemic and deadly vaccine side effects (Parmet, 2010).

The connection between populism and inadequate health policies is so concerning that Lasco and Curato (2019) propose the concept of medical populism. The authors define medical populism as employing simplified, anti-intellectual, and direct discourse that dramatizes health crises in an attempt to pit the people against the establishment. Medical populists often propose “ ‘common sense’ solutions to complex issues” (Lasco and Curato, 2019). Notable instances include South African president Thabo Mbeki’s HIV denialism in the 2000s, the Philippines’ Public Attorney Persida Acosta’s unfounded accusations against Dengvaxia vaccines during a dengue fever outbreak in 2016, and the 2014 calls by Donald Trump and Senator Rand Paul for a ban on all flights from West African nations during the Ebola outbreak. Further examples are found in the Philippines and Thailand, where leaders Rodrigo Duterte in the mid-2010s and Thaksin Shinawatra in the early 2000s, respectively, tried to attribute the blame for high drug usage rates to their political adversaries.

During the COVID-19 pandemic, many authoritarian far-right leaders used the crisis

to consolidate power and suppress dissent. Duterte’s administration amended the Philippine Anti-Terrorism Act of 2007 and intensified repression against opposition (Sajor, 2022). Concurrently, law enforcement detained 30,000 individuals for violating COVID-19 quarantine regulations (Barceló et al., 2022). Cambodia issued a state of emergency law that allowed Prime Minister Hun Sen’s government to override human rights safeguards (Human Rights Watch, 2020). In Hungary, the pandemic served as a pretext to grant Prime Minister Viktor Orbán decree powers that he opportunistically used to restrict freedom and pursue an anti-LGBTQ+ agenda (Stenberg et al., 2022). Likewise, Ugandan President Yoweri Museveni successfully claimed exceptional Executive prerogatives to ban political rallies and prohibit local political campaigning in person during the 2021 elections (Imran and Javed, 2024).

Some other right-wing populist national leaders, such as Jair Bolsonaro, Rodrigo Duterte, and Donald Trump, embraced COVID-19 denialism (Lasco, 2020). In 2020, Brazil and the US, under the leadership of Bolsonaro and Trump, respectively, were ranked among the worst in pandemic response across more than 100 countries (Lowy Institute, 2021). Indian Prime Minister Narendra Modi recommended non-evidence-based measures to prevent COVID-19 (such as yoga) and participated in political rallies, drawing crowds while prematurely declaring victory over the pandemic (Imran and Javed, 2024). Populists often blame scapegoats (e.g., China) for the COVID crisis, undermine institutions reporting on the pandemic’s severity, and dismiss expert opinions that challenge their stated beliefs (McKee et al., 2021).

Trump and Bolsonaro both downplayed the severity of the COVID-19 pandemic and embraced the antimalarial drugs hydroxychloroquine (HCQ) and the antibiotic azithromycin as panaceas, against scientific advice. Both leaders also expressed gratitude towards Prime Minister Modi when India lifted its export ban on hydroxychloroquine in early April 2020. As the number of COVID-19 cases continued to increase in the US, Trump reduced his support of non-evidence-based preventative COVID-19 therapies and announced the first partnerships to source COVID-19 vaccines with AstraZeneca in May 2020 and Moderna in August (Casarões and Magalhães, 2021). Bolsonaro, however, dou-

bled down on non-evidence-based COVID-19 therapies, opposed social distancing policies, and delayed vaccine purchases, signing a contract with AstraZeneca only in June 2020, and much later with CoronaVac, Pfizer, and Janssen (from January to March 2021). Even after the late purchase of the vaccines, Bolsonaro insisted on supporting non-evidence-based treatments in his speech to the United Nations General Assembly in September 2021.

There is substantial observational evidence linking right-wing ideology and populism with COVID-19 denial behavior and policies. In Brazil, support for Bolsonaro correlates positively with COVID-19 fatality rates (Almeida et al., 2022) and negatively with vaccination rates (Peixoto et al., 2023) at the municipal level. In the US, right-wing partisanship and conservative media viewership are associated with COVID-19 misperceptions (Druckman et al., 2021) and conspiracy beliefs (Stecula and Pickup, 2021), as well as lower adherence to social distancing (Ash et al., 2023). In Europe, populist attitudes correlate positively with vaccine hesitancy (Recio-Román et al., 2021), and science-related populism negatively impacts vaccination rates in countries like Austria, Germany (Kohler and Koinig, 2023), and Italy (Kreps and Kriner, 2023), though less so in the UK (Klymak and Vlandas, 2022).

There is an emerging literature providing causal evidence that populism impacts health outcomes. Survey experimental evidence shows that exposing voters to Trump’s anti-vax tweets increases willingness to vaccinate children for MMR among his supporters, but not among non-supporters (Hornsey et al., 2020). Some event studies show a divergent pattern in the response of perceived risk and social distancing to local exposure to COVID-19 cases: in areas with high Trump vote share, this reaction is less intense (Allcott et al., 2020; Barrios and Hochberg, 2021). A similar design shows a similar ideological divide in Brazil: Bolsonaro’s speeches dismissing social distancing reduce actual levels of social distancing, but only in municipalities where he was politically popular (Ajzenman et al., 2023).

Following this discussion, I propose two hypotheses:

Hypothesis 1: Municipalities governed by right-populist mayors will exhibit lower COVID-19 vaccination rates than those run by non-right-populist mayors.

Hypothesis 2: Municipalities governed by right-populist mayors will have more COVID-19 cases and deaths per capita.

It is relevant to clarify why candidates' parties' ideologies should not be used as a proxy for local right-populism. While traditional Brazilian brokerage relations rely on party alliances (Brollo and Nannicinni, 2012; Bueno, 2018), Bolsonaro sought to distance himself from such alliances during the initial phase of his presidency, often referring to them as "old politics." His disaffiliation from his party in 2019 complicated the alignment of local and national alliances. Additionally, local politics in Brazil do not always follow partisan lines, and local alliances at the time did not have to include the same parties as national coalitions.

Brazil's extensive National Immunization Program and historically high levels of confidence in vaccines starkly contrast the populist undermining of public health policies, making it an exemplary scenario to explore the impacts of political interference on health outcomes. This case is particularly significant given Brazil's role as a major global player in public health, with a unique model of universal health coverage and a longstanding commitment to widespread vaccine coverage. Moreover, mayors had the primary authority over COVID-19 vaccination policy implementation. The Brazilian case illustrates how local right-wing populism can destabilize well-established health systems. The dynamics observed in Brazil are indicative of broader global challenges where populist rhetoric may influence health behaviors and policy implementations.

More broadly, this study relates to the literature on the impacts of right-populism on policy outcomes. For instance, survey experiments show that revealing information about the local level of popularity of Donald Trump increases respondents' willingness to express xenophobic views (Bursztyn et al., 2020), showing that populism can affect social norms. Additionally, far-right populists in Hungary use targeted government advertising

to capture media and distort media content (Szeidl and Szucs, 2021).

3 Public Health under Populist Politics: The Brazilian Case

In October 2018, the right-wing populist politician Jair Bolsonaro won the Brazilian presidential elections, riding the waves of populist sentiments and anti-establishment fervor, backed by a coalition of social conservatives and economic liberals (Evans, 2018). Throughout his political career, Bolsonaro’s rhetoric and actions violated democratic norms as he openly opposed the rights of minorities, including Indigenous peoples, women, and LGBT populations. During his presidency, Bolsonaro repeatedly harassed left-wing individuals, claimed unfounded electoral fraud, and inflamed public feelings toward the Judiciary. In a particularly alarming event on April 19, 2020, Bolsonaro himself participated in a demonstration calling for the dissolution of the Brazilian Supreme Court and Congress.

Right-wing populist leaders tend to discredit scientific evidence and oppose independent media (Lasco, 2020; Putzel, 2020). In Brazil and the United States, populist presidents delayed adequate response to the COVID-19 pandemic (Fonseca et al., 2021b). Like Donald Trump, Bolsonaro downplayed the importance of social distancing and encouraged pro-government demonstrations and crowding (Costa and Bernardi, 2020). His administration was also marked by a denialist approach to environmental policy ¹.

Bolsonaro used his social media to attack mayors and governors who implemented social distancing measures and characterized the press as leftist and untruthful. Despite Brazil having a comprehensive public health system, a relatively young population, and a low incidence of obesity, during much of 2020 and 2021, its COVID-19 deaths per capita were higher than those in Europe and the United States (Fonseca et al., 2021b).

In this context, Brazil is an ideal case to test whether local right-wing populism affects

¹In 2019, Bolsonaro’s environment minister, Ricardo Salles, fired the director of the National Institute of Space Research, Ricardo Galvão, who publicly raised concerns about alarming levels of deforestation in the Amazon Forest.

health outcomes. Brazil is among the countries that supply one of the widest varieties of vaccines free of cost worldwide, for more than 20 different diseases in its National Immunization Program, which is present in all municipalities (Domingues et al., 2020; Pércio et al., 2023). For instance, in 2020, the Brazilian vaccination coverage with at least one dose was 95.9% for measles and 98.8% for pertussis (Plans-Rubió, 2021). The Brazilian public health system is the single provider of health services for 75% of the population. Historical levels of trust in vaccines in Brazil are high. In 2015, 92.9% of Brazilian respondents to the Vaccine Confidence Index survey believed that vaccines are important for children, the fourth-highest country average in the world at the time. However, these numbers fell to 89% in 2019 (Figueiredo et al., 2020). Belief in vaccine safety fell from 73% in 2015 to 63% in 2019.

Importantly, according to Law 14,125 of 2021, vaccines purchased by private entities in Brazil had to be donated to the public sector until the planned deadline for the immunization of priority groups. Private vaccination for COVID-19 only became legal in June 2022. Therefore, vaccination outcomes are directly attributable to public policies.

Bolsonaro’s discourse framed the control of the pandemic as a trade-off between economic stability and health. Bolsonaro did not support his Ministry of Health’s decision to declare a state of emergency in February 2020, claimed to be ultimately in charge of the health policy, and isolated his ministry from public events and meetings (Casarões and Magalhães, 2021). Bolsonaro’s discourse was so pervasive that a quantitative text analysis of Brazil’s four leading newspapers in mid-early 2020 shows that words associated with Bolsonaro include “hysteria”, “lockdown”, and “little flu” (Fonseca et al., 2021b). Bolsonaro tried to shift the blame to local politicians who implemented social isolation protocols for the economic disruption (Fonseca et al., 2021b). For instance, in March 2020, he stated, “What a few governors and mayors are doing in Brazil is a crime. They’re smashing up the country; they’re destroying jobs.”

In mid-April, Bolsonaro fired his Minister of Health, Luiz Henrique Mandetta, who called for more action to fight the pandemic and was against hydroxychloroquine as a treatment for COVID-19. After less than a month in office, his appointed substitute,

Nelson Teich, a noncontroversial physician and businessman, Bolsonaro nominated a military general, Eduardo Pazuello, an ally willing to not advance social distancing measures and to implement the spread of treatments uncorroborated by scientific evidence, such as chloroquine. In the same month, the Brazilian Supreme Court ruled that in the absence of adequate federal policies to fight the spread of COVID-19, states and municipalities had the power to adopt their own social distancing and vaccine procurement measures (Fonseca et al., 2021a).

The Brazilian government ignored three offers by Pfizer to purchase vaccines in August 2020. Bolsonaro would only sign a contract with Pfizer in March 2021. Bolsonaro exaggerated concerns about the potential side effects of the vaccine and facetiously suggested that the vaccine could “turn people into crocodiles”. Faced with the federal government’s inaction and pursuing electoral gains for the upcoming 2022 presidential elections, São Paulo state governor João Dória signed an agreement with the Chinese company Sino-vac Life Science to procure vaccines and transfer technology to the state public research center and immunobiological producer Instituto Butantan. Bolsonaro repeatedly claimed that the Chinese vaccine was unsafe.

The populist COVID-19 denial resonated in Brazil. Using an event-studies design, Ajzenman et al. (2023) shows that after Bolsonaro’s speeches dismissing the severity of COVID, social distancing declined in localities that supported the president. On the one hand, despite the worsening of COVID-19 cases and deaths, Bolsonaro’s approval rate in 2020 increased from 32% in January to 39% in December (Folha de S.Paulo, 2020a). Bolsonaro also led the Brazilian politicians’ index of digital popularity throughout the year (Folha de S.Paulo, 2020b). Fake news about vaccines on social media grew in Brazil, and a study points out that in March 2021, 48.4% of sampled fake news was related to vaccines (Galhardi et al., 2022). The anti-vax discourse affected citizens’ behavior. Between January and April 2021, over 1.5 million people who got vaccinated with a first shot for COVID-19 did not return to get a second shot.

On the other hand, presidential approval was polarized. By early July 2021, approximately half of Brazilians blamed President Bolsonaro for delays in vaccination (UOL,

2021). Bolsonaro ended his first term with the highest disapproval rate since the impeachment of Fernando Collor in 1992, with 37%. In April 2021, the Brazilian Congress launched an investigation into the federal government’s response to COVID-19. During this inquiry, Pedro Hallal, the coordinator of the most extensive seroprevalence study in Brazil (Hallal et al., 2020), affirmed that 95 to 145 thousand deaths in Brazil could have been avoided if Bolsonaro purchased vaccines from Sinovac and Pfizer earlier (Phillips, 2021). Another study estimates that more than 31.6 thousand deaths could have been avoided if vaccination started 30 days earlier (Barbosa Libotte et al., 2022).

3.1 Institutional Context

A brief discussion about the Brazilian institutional context is appropriate here. Brazilian elections are managed by the Electoral Justice, a system relatively insulated from both the Executive and the Legislative branches. Following a predefined calendar, elections consistently take place on Sundays in October². Local elections and general elections alternate every two years. Local elections include contests for city councilors and mayoral positions, while general elections encompass the selection of the president, senators, governors, state representatives, and federal representatives.

Regarding the dispute for presidential and gubernatorial offices, a runoff election becomes obligatory if the leading candidate fails to secure a majority in the initial round. Mayoral elections use a similar runoff system only for cities with more than 200,000 registered voters. All political candidates must legally affiliate with a political party to run for office. Notably, voting is compulsory, and the turnout rate typically hovers around 85% (Fujiwara, 2011).

Brazil is a federal republic and is often considered a case of a fragmented party system coupled with ideologically incoherent parties, legislative fragmentation, personalistic elections, and voters’ weak partisan attachment (Ames, 1994; Mainwaring, 1999; Samuels,

²In the middle of the COVID-19 pandemic, the 2020 Brazilian local elections were exceptionally delayed to November. In 2020, every one of the 5,570 municipalities held elections for mayors and city councilors, except for the city of Macapá, which underwent elections in the following December due to a local power supply crisis that lasted for 22 days. For the other 5,569 municipalities, the first run occurred on November 15th, and the runoff elections happened on November 29th.

2000; Samuels and Zucco, 2018). Incumbent mayors are relevant brokers for higher-office candidates and exchange political support for state and federal discretionary transfers (Ames, 1994; Avelino et al., 2012; Hidalgo and Nichter, 2016; Novaes, 2018; Ventura, 2021).

Brazilian municipalities are the primary providers of public policies in relevant areas such as health, primary education, sanitation, urban zoning, and transportation, but often depend on fiscal transfers from the states and the federal government to fund such goods. Part of these transfers is discretionary and affected by the alignment of the mayor with the incumbent party in higher offices (Brollo and Nannicinni, 2012; Bueno, 2018; Frey, 2022).

4 Measuring Ideology from Manifestos

Candidates for the executive office in Brazil are legally required to present manifestos called government plans (in Portuguese, *propostas de governo*). These plans have no specific format or guideline, resulting in substantial variation in structure, length, and content.

This article presents a novel measure of candidate-level right-wing populism for 14,828 mayoral candidates distributed among 33 parties and 5,459 Brazilian municipalities. I applied a quantitative text analysis on individual candidate manifestos from the 2020 Brazilian local elections to develop this measure. I web scraped the manifestos from the Superior Electoral Court (TSE) and used optical character recognition (OCR) software available from Ooms (2023) to convert images to text when the documents were not already machine-readable.

To the best extent of my knowledge, there is no existing alternative measure of local Brazilian candidates' right-wing populism. One possible solution would be to use the measures of party ideology at the national level available, for example, from Power and Zucco (2009) or Bolognesi et al. (2022). Nonetheless, such a measure might fail to capture substantial ideological variance within parties and neglect programmatic differences

between rightist ideology and right-wing populism. Additionally, there may be little consistency between national programs and local platforms, considering the incoherence in Brazilian political parties (Ames, 1994; Mainwaring, 1999).

The corpus used for the analysis includes mayoral manifestos and the two most-voted presidential candidates’ manifestos in 2018: Fernando Haddad’s (PT) and Jair Bolsonaro’s (PSL). After excluding manifestos with a median OCR reading quality score under 0.95 (on a scale of 0 to 1) or length less than or equal to 300 characters, the final corpus had 14,828 manifestos of a total of 19,131 mayoral candidates in 2020.

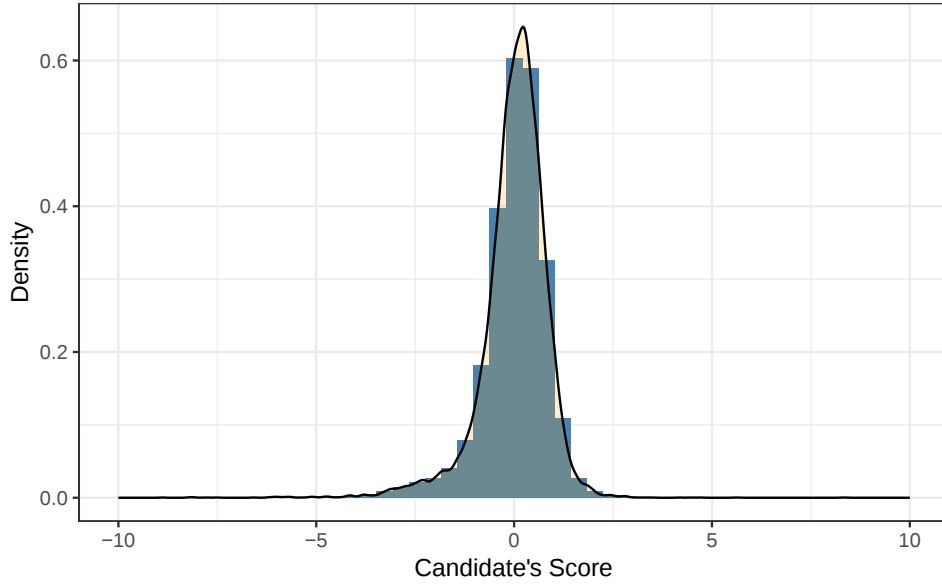
Text analysis statistical learning models typically depend on functions of counts of units of language called tokens, which designate minimal linguistic entities that convey a meaningful sense. However, multi-word expressions pose challenges to identifying tokens with a complete meaning. For instance, the phrase “public-private partnership” typically represents a right-wing economic sense that differs from the left-wing economic meaning of the word “public”. In order to account for expressions as such, I group occurrences of three-word expressions that are significant at the 0.01 level using the statistic proposed by Blaheta and Johnson (2001) and implemented in the software available from Benoit et al. (2018).

Text preprocessing is crucial for text as data analysis in social sciences (Grimmer and Stewart, 2013). Before the text analysis, the manifestos were preprocessed to remove punctuations, numbers, symbols, social media tags, internet links (URLs), words with two or fewer characters, candidates’ names, party names and acronyms, and state names and acronyms. I also removed accents and apostrophes. Since the reference to local affairs might correlate with ideology, I map any reference to municipalities’ names to the token <local>. I additionally excluded typos, words related to administrative candidacy procedures, and references to regional areas such as “Region South”.

To better account for different words with similar meanings, I reduced the tokens to their stems³. To better display results, I map stems back to their most frequent

³A stem is the root of a word after the removal of suffixes. For example, the stem of both terms *political* and *politics* is *polit*.

Figure 1: Histogram and Kernel Density of Mayoral Candidates’ Right Wing Populism



Notes: The right-wing populism measure is demeaned. Therefore, the average across the mayoral candidates’ measure distribution in the national pool is zero. The estimates range from -35.3 to 11.9, but the graph excludes outliers beyond the range of -10 to 10 for better visualization.

corresponding surface form⁴. To account for negation, I add a prefix *NOT_* for occurrences of words after a negative word within a quasi-sentence, following the recommendation of Jurafsky and Martin (2023). For example, the phrase “I will not use public resources, which are essential, for personal gains” becomes “I will not *NOT_*use public *NOT_*resources, which are essential, for personal gains”.

The quantity of interest to estimate from each textual manifesto is the mayoral candidate’s degree of right-wing populism. To achieve this purpose, I use a Naïve Bayes classifier (NB), a supervised machine learning algorithm. For the estimation, the user must supply a labeled training set of documents belonging to a finite set of classes, and the NB estimates the probability of a document belonging to each class. In this application, I use the NB to compute the likelihood of each mayoral manifesto belonging to the right-populist class.

One of the main advantages of the NB is that, unlike other techniques standard in the discipline, such as Wordfish (Slapin and Proksch, 2008) and Wordscores (Laver et al.,

⁴For example, after stemming, *political*, *politics*, *politically*, and *polity* all become *polit* and are displayed for presentational purposes as the most frequent term among them, for instance, *politics*.

2003), it does not rely on distributional assumptions about the data generation process of words. Moreover, since it is a supervised algorithm, the classification must conform to the same class space as the training data provided.

Scholars in computer science have used the NB to classify political texts in many applications, such as social media political participation in Indonesia (Hidayatillah et al., 2019), political news sentiment in Turkey (Kaya et al., 2012), Egypt, and Indonesia (Soelistio and Surendra, 2015), social media political sentiment in the US (Awwalu et al., 2019; Hamoud et al., 2018) and Egypt (Elghazaly et al., 2016), detection of fake news about the US 2016 elections (Dinesh and Rajendran, 2021), and political articles sentiment in Arabic (Abd et al., 2019). The NB has been used in Political Science for predicting electoral fraud in Argentinean elections (Cantú and Saiegh, 2011) but to my knowledge has been underutilized in the field for the measurement of populism.

The NB is a bag-of-words text analysis classifier, i.e., it assumes that the classification of each document depends on the word frequencies but not on their positions, the so-called Naïve Bayes assumption. In the present application, the class set contains the two classes *right-wing populism* and *left*. Using the Bayes’ Rule, we can derive the posterior probability of a class c given a document d in terms of the likelihood $P(d|c)$ and a prior $P(c)$.

$$P(c|d) = \frac{P(d|c)P(c)}{P(d)} \propto P(d|c)P(c) \quad (1)$$

In Equation 1, the symbol $\propto$ means “is proportional to”. Under the Naïve Bayes assumption, the likelihood $P(d|c)$ can be expressed in terms of functions of word-frequencies w for a finite vocabulary $\mathcal{V}$ of cardinality n . I additionally assume a flat prior such that $P(c) = 0.5$ for both classes.

$$P(d|c) = P(w_1, w_2, \dots, w_n|c) = \prod_{w \in \mathcal{V}} P(w|c) \quad (2)$$

I use the proportion of word count per document $f(w_i, c)$ as the word-specific feature to mitigate the influence of document-length variability in the classification. To avoid the likelihood of a document being driven to zero due to any single missing word, the classifier typically adds a smoothing factor s , which I set to 0.001. We can derive the posterior probability of interest by substituting the aforementioned flat prior and the likelihood from Equation 2 into Equation 1.

$$P(c|d) \approx 0.5 \prod_{i=1, \dots, |\mathcal{V}|} \frac{f(w_i, c) + s}{\sum_{w \in \mathcal{V}} f(w, c) + s|\mathcal{V}|} \quad (3)$$

The NB must compute the frequencies $f(w_i, c)$ in a training set of documents previously labeled as belonging to each class. Then, it uses Equation 3 to extend the classification to all manifestos. Given smoothing, tokens unobserved in the training data do not affect the classification. To compose the training data, I label Bolsonaro’s 2018 manifesto and the manifestos of 13 mayoral candidates from the 2020 elections publicly sponsored by him as *right-wing populism*⁵. I label Haddad’s 2018 manifesto and the manifestos of 14 leftist candidates competing in the same municipalities as those supported by Bolsonaro as *left*⁶.

The measure of ideology is defined as the demeaned predicted probability of a document being right-populist, scaled to the interval of -100 to 100, as expressed in the equation below, where x_i is the i -th mayoral candidate ideology, and $P(RWP|d_i)$ is the probability of the document d presented by candidate i belonging to the class *right-wing populism*.

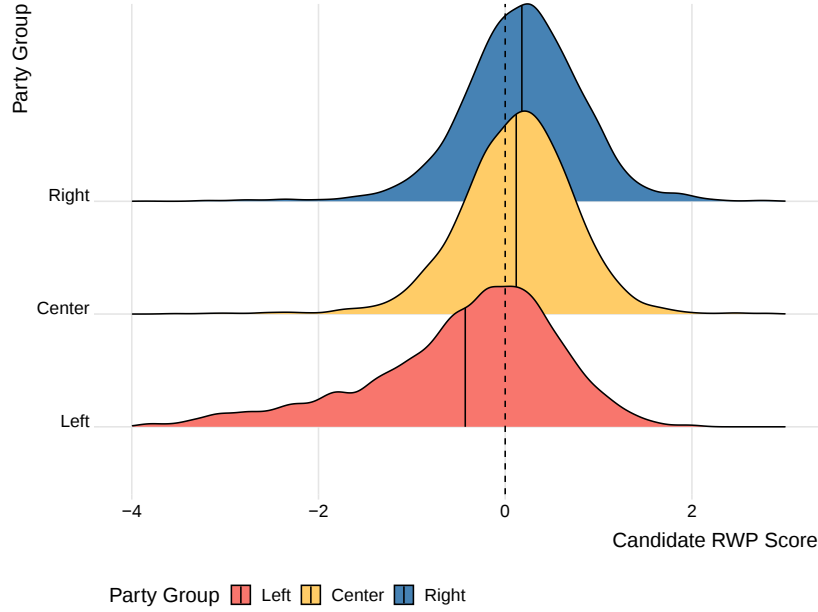
$$x_i = 100 \left((P(RWP|d_i) - \frac{1}{N} \sum_i P(RWP|d_i)) \right)$$

Some important expressions associated with the manifestos classified as left allude to public health, public servants’ compensation and career, democracy, race, urban develop-

⁵The list of candidates supported by Bolsonaro was extensively published by the domestic press and is available, for example, from <https://g1.globo.com/politica/eleicoes/2020/eleicao-em-numeros/noticia/2020/11/16/maioria-dos-candidatos-a-prefeitura-apoiados-por-bolsonaro-nao-se-elege-no-pais.ghtml> (in Portuguese).

⁶The leftist candidates in the training data are affiliated with the parties PT, PSOL, PDT, and PSTU.

Figure 2: Mayoral Candidates' Right Wing Populism Distribution by National Ideology Party Group



Notes: Party groups are defined by partitioning the expert-based measures of party ideology estimated by Bolognesi et al. (2022) into three contiguous subgroups.

ment, social movements, gender, riverside communities⁷, and sexual orientation. On the right side, expressions referring to meritocracy, entrepreneurship, civic-military schools⁸, public bureaucracy reform, efficiency, public-private partnerships, Christianity, morality, and corruption are common. Therefore, the manifestos classified as RWP are associated with economic liberalism and social conservatism, and those classified as non-RWP are related to economic interventionism and cultural progressivism. The Tables A.2 and A.1 in the Appendix display the list of the 50 most influential words in the classification for the training data. Additionally, Table A.3 presents a list of selected words and associated ideologies.

To better understand how party ideology relates to local right-wing populism, I use the measure of national party ideology estimated by Bolognesi et al. (2022) based on expert-

⁷Riverside communities (in Portuguese, *comunidades ribeirinhas*) are traditional communities that live among rivers and usually depend on fishing, foraging, low-scale farming and, recently, ecotourism. They are formally recognized since 2007 by the National Policy for the Sustainable Development of Traditional Peoples and Communities as a target population for diverse social policies.

⁸The National Program of Civic-Military Schools was an educational policy sponsored by Bolsonaro's government in 2019, in which members of the Military Police and the armed forces worked in schools as monitors without any strictly academic functions. The educational curriculum remained the same as that defined by State Secretariats for Education for public schools. Approximately 230 schools adhered to this national program, which Lula's government has phased out since July 2023.

based surveys conducted in 2018. Figure 2 shows the distribution of RWP scores by three contiguous party groups defined based on this measure⁹. The correlation between the party means obtained from the expert-based national measure and the manifesto-based local measure is 0.84. Figure B.1, in the Appendix, compares the distribution of candidates’ right-wing populism by party with the 95% confidence intervals from the estimates provided by Bolognesi et al. (2022). Finally, Figure B.2 in the Appendix presents the mean ideological score by state.

5 Research Design and Data

I use a close-elections regression discontinuity (RD) design to causally identify the effect of electing a right-populist mayor (in 2020) on vaccination rates and COVID-19 deaths and cases in subsequent years¹⁰. The identification assumption underlying a close-elections RD design is that, as the margin of victory shrinks to zero, the difference between almost losers and almost winners depends on luck and random, unpredictable events, not on pre-treatment unobserved characteristics.

In this research design, the treatment group consists of municipalities where a right-populist mayoral candidate won by a close margin of victory against a non-right-populist competitor. The control group, by extension, consists of municipalities where a non-right-populist candidate won over a right-populist candidate in a close election. The estimation equation is displayed below.

$$y_i = f(m_i, Z_i; \beta) + \alpha T_i + T_i g(m_i, Z_i; \lambda) + \epsilon_i$$

In the equation above, y_i represents the outcome. The main outcomes are COVID-19 vaccination rates (first dose, second dose, full schedule, and all doses), number of months

⁹The leftist parties are PSTU, UP, PCO, PCB, PSOL, PC do B, PT, PDT, PSB, and REDE. The centrist parties are CIDADANIA, PV, PTB, AVANTE, SOLIDARIEDADE, PMN, PMB, PHS, MDB, PSD, and PSDB. The rightist parties are PODE, PPL, PRTB, PROS, PRP, REPUBLICANOS, PL, PTC, PSL, DC, NOVO, PP, PSC, UNIÃO, PATRIOTA, and DEM.

¹⁰A notable issue with the specification mentioned above is that it inherently requires municipalities to meet a criterion where the top two mayoral candidates belong to divergent sides of the political spectrum for inclusion in the sample. This particular design choice results in a considerable sample loss.

to reach a 70% full vaccination rate ¹¹, and COVID-19 cases and deaths per capita. The margin of victory m_i is the running variable, defined as positive when a right-populist mayor wins the 2020 local elections and negative when the non-right-populist mayor wins. The treatment T_i is a dummy variable indicating whether a right-populist candidate won the mayoral elections. The functions f and g are continuous parametric functions, with the linear case being the preferred specification. These functions are allowed to differ between treated and control groups.

The vector of municipal-level covariates Z_i includes illiteracy rate, average years of education, Gini inequality index, per capita income (log-scale), share of population 65 years or older, rural population share, female population share, public worker population share, population in 2017 (log-scale), number of COVID-19 cases and deaths on the day before the first election round (log-scale), Bolsonaro’s vote share in 2018, mayor’s alignment with the governor’s party, mayor’s alignment with the parties in the governor’s coalition, incumbency indicator, mayor’s college degree indicator, male mayor indicator, mayor’s age, indicator for whether the mayor is white, state fixed effects, and party fixed effects. The inclusion of state fixed effects is particularly important since vaccine distribution among municipalities is determined at the state level. The error term is ϵ_i . The local average treatment effect (LATE) of electing a right-populist mayor is given by α , which is the parameter of interest.

In this research design, the municipality is the unit of analysis, indicated by the subscript i . The identification assumption is that, in close elections, at the limit, the difference between a municipality where a populist right-wing mayor is elected and another where this does not occur is purely exogenous.

I code a mayor as a right-populist if their score is above the median of the national pool of candidates and non-right-populist otherwise. Therefore, the control group contains leftist, centrist, and moderate-right-wing mayors under that cutoff. I provide robustness checks using alternative cutoffs.

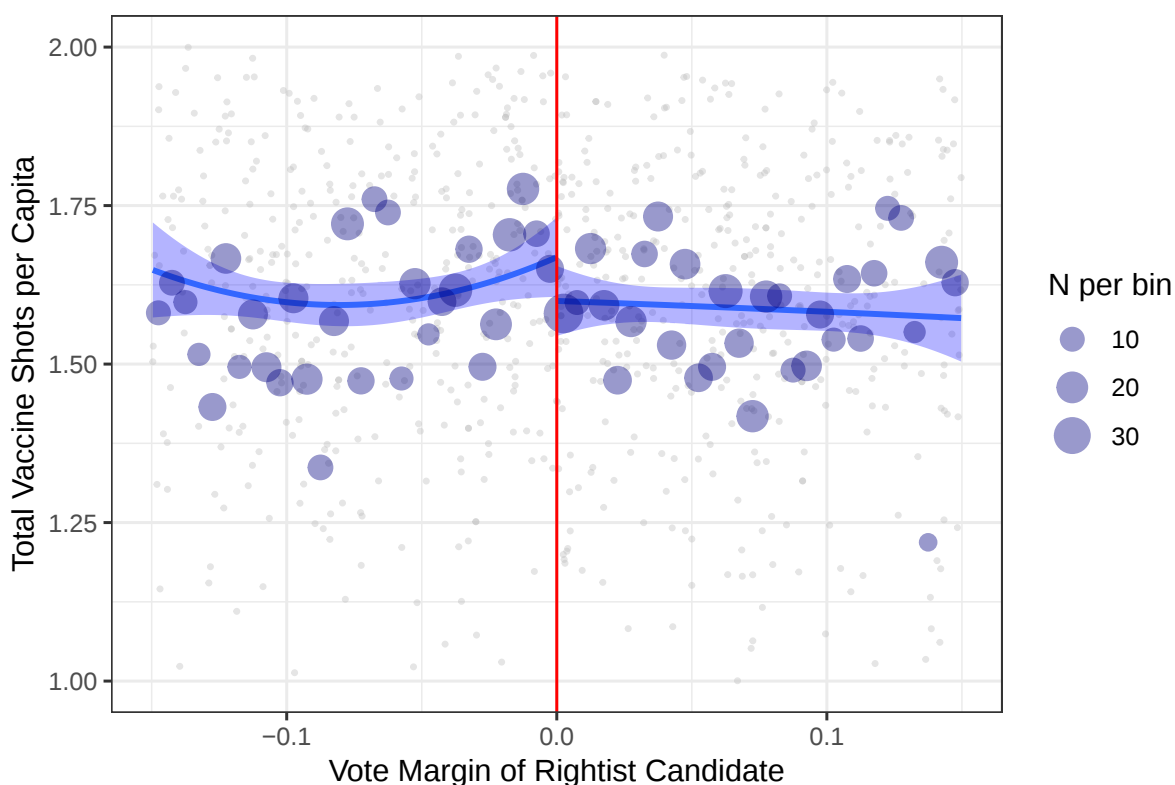
For the close election to provide a quasi-experimental framework for a causal in-

¹¹The threshold of 70% was chosen due to the early estimates that herd immunity would be achieved if approximately 67% of the population in a country is immunized (Randolph and Barreiro, 2020).

terpretation of the estimates, the mayoral candidates cannot precisely manipulate their assignment to the treatment or control group, and the municipalities' pre-treatment characteristics must vary continuously around the margin of victory cutoff of zero. I provide manipulation and balance tests to assess these assumptions in the following section.

The electoral data and the text of the manifestos are available from the Superior Electoral Court (TSE), and socioeconomic data are available from the Brazilian Institute of Geography and Statistics (IBGE) and the National Treasury. Unless otherwise specified, the socioeconomic data pertain to the 2010 National Census. Data on COVID-19 cases and deaths are available from Cota (2020). Vaccination data for COVID-19 are available from the Brazilian Health Ministry Information System (DataSUS).

Figure 3: Effect of Electing a Right-Populist Mayor on Total Shots per Capita



Notes: Circles display the outcome means for equally sized bins. The area of each circle is proportional to the number of observations per bin. The fitted line uses a different second-degree polynomial regression for each group (control or treatment). The estimation uses the entire sample, even though the graph displays a limited range for better visualization. Jittered raw observations are displayed in gray.

Table 1: Effect of Electing a Right-Populist Mayor on Health Outcomes

Outcome	Year	Control Mean	LATE	SE	P-value		Bandwidth	N
First-Dose Shots per Capita	2021	0.803	-0.033	0.013	0.011	**	0.107	691
Second-Dose Shots per Capita	2021	0.690	-0.026	0.011	0.026	**	0.142	852
Full-Schedule per Capita	2021	0.713	-0.028	0.012	0.018	**	0.137	828
All-Doses per Capita	2021	1.656	-0.059	0.027	0.030	**	0.127	797
# Months until 70% 1st-Dose Vaccination	All	2.423	0.610	0.550	0.260		0.110	720
# Months until 70% 2nd-Dose Vaccination	All	4.471	1.520	0.730	0.040	**	0.120	755
# Months until 70% Full Vaccination	All	4.010	1.860	0.720	0.010	***	0.110	718
New Cases per Capita	2021	0.094	-0.002	0.004	0.582		0.148	883
New Deaths per Capita	2021	0.008	0.000	0.000	0.909		0.180	1005

Notes: Results from local linear regressions with triangular kernel and controls included. The treatment is electing a mayor with a score above the median in the national pool of candidates. Each row is the result of an RD regression for a different outcome, considering the aforementioned treatment. The optimal bandwidth choice follows the MSE-minimization procedure suggested by Calonico et al. (2020).

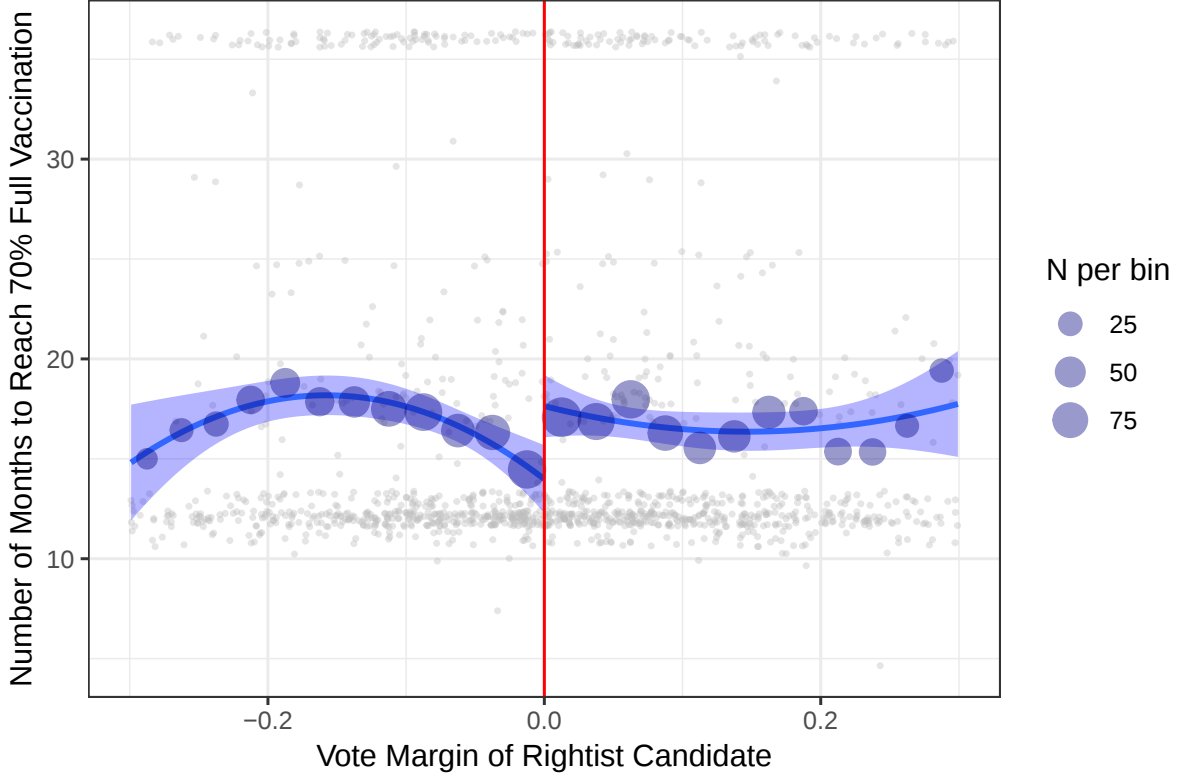
6 Results

Table 1 presents the main results. Electing a right-populist mayor decreases full-schedule vaccination rates by 2.8 percentage points, a reduction of 3.9% from the control group’s local mean outcome (71.3%). Considering that this effect is driven by populism after accounting for an extensive set of sociodemographic and political characteristics, the difference is sizeable. If such an effect were extrapolated to the entire Brazilian population, this would imply that approximately 5.9 million people would not reach full COVID-19 vaccination. Furthermore, municipalities with right-populist mayors required an additional 1.86 months to reach a 70% full vaccination rate, as illustrated graphically in Figure 4.

The estimates for the treatment effect on the first dose, second dose, and all doses per capita are also negative and similar in size. Figure 3 displays the result of electing a right-wing populist mayor on the total shots of COVID-19 vaccines per capita. Altogether, these results provide evidence supporting Hypothesis 1.

However, the results from Table 1 show that there is no significant effect on cases and deaths per capita, thereby not supporting Hypothesis 2. One limitation of using deaths and cases as proxies is the fact that in Brazil, COVID-19 diagnoses mostly depended on testing policies. For the same reasons that right-populist mayors vaccinate at lower rates, they might neglect testing for COVID-19. Many states in Brazil used COVID-19 incidence key performance indicators to decide on whether to tighten or relax social

Figure 4: Effect of Electing a Right-Populist Mayor on Number of Months until 70% Vaccination



Notes: Circles display the outcome means for equally sized bins. The area of each circle is proportional to the number of observations per bin. The fitted line uses a different second-degree polynomial regression for each group (control or treatment). The estimation uses the entire sample, even though the graph displays a limited range for better visualization. Jittered raw observations are displayed in gray.

distancing policies. Therefore, populist mayors willing to compromise social distancing in order to protect local businesses have an incentive to underprovide COVID-19 tests.

Table B.1 in the Appendix provides descriptive statistics for the main variables in the close-elections sample. Table B.2 provides a comparison between the full sample of municipalities with more than one candidate and the close elections sample. At the 5% significance level, only two pre-treatment variables differ significantly in means. In the close elections sample, incumbents are less common, and the cities have slightly lower GDP than average. Both differences are small relative to the respective standard deviation. This comparison suggests that the external validity of the results extends to most municipalities.

Table 2: LATE on Health Outcomes in Sample of Mayors from Center and Right-Wing Parties

Outcome	Year	Control Mean	LATE	SE	P_value		Bandwidth	N
First-Dose Shots per Capita	2021	0.830	-0.051	0.014	0.000	***	0.100	333
Second-Dose Shots per Capita	2021	0.717	-0.049	0.012	0.000	***	0.109	358
Full-Schedule per Capita	2021	0.742	-0.052	0.012	0.000	***	0.118	385
All-Doses per Capita	2021	1.712	-0.106	0.030	0.000	***	0.109	358
New Cases per Capita	2021	0.094	0.000	0.005	0.943		0.157	468
New Deaths per Capita	2021	0.008	-0.001	0.001	0.068	*	0.148	440

Notes: Results from local linear regressions with triangular kernel. The treatment is electing a mayor with a score above the median in the national pool of candidates. The choice of the optimal bandwidth follows the MSE-minimization procedure suggested by Calonico et al. (2020).

6.1 Robustness Checks

In regression-discontinuity designs, a critical assumption is that units below and above the treatment assignment cutoff are comparable in terms of pre-treatment characteristics. In this application, such an assumption implies that, as the margin of victory goes to zero, municipalities that elected a right-wing populist mayor and those that elected a mayor not classified as right-populist should be similar on average in terms of demographics, socioeconomic composition, voters' ideological leaning, and any other unobservable characteristic. We can test this assumption for observable variables using balance tests.

Table 3 shows the results of this exercise. Among all of the main controls, the mayor's gender is the only variable that has a significant discontinuity at the 10% significance level. Female candidates are more common in the treated municipalities. In the Appendix, Table B.4 shows the balance tests for the party and state dummies. Municipalities from the states of Rio de Janeiro and Amazonas are more common in the treated group, and municipalities from the moderate Republican Party of the Social Order (PROS) are less common in the treated group. Within a set of 76 control variables, the discontinuity in only 4 variables can plausibly be attributed to chance.

Figure B.3 graphically presents the local polynomial density estimation using the procedure introduced by Cattaneo et al. (2018). We fail to reject the hypothesis of continuity in the density of the margin of victory, which indicates that the candidates cannot perfectly manipulate their victory. Therefore, the quasi-experimental design is credible, and the local estimates are likely causally identified.

Table 3: Balance Tests: Main Covariates

Outcome	Control Mean	LATE	SE	P-value	s	N
Average Education	9.504	-0.064	0.175	0.713		992
Bolsonaro's Vote Share 2018	0.457	0.037	0.032	0.252		970
Elderly Pop. Share	8.539	-0.189	0.399	0.636		841
Female Pop. Share	49.445	-0.098	0.183	0.591		1173
Gini Inequality	0.489	0.007	0.010	0.506		948
Illiteracy Rate	16.000	-0.975	1.515	0.520		961
Incumbent Mayor	0.288	-0.079	0.070	0.263		900
Log GDP	19.166	0.059	0.185	0.751		1184
Log Income per Capita	6.062	0.038	0.072	0.592		964
Log Population	9.295	0.119	0.157	0.448		1115
Male Mayor	0.856	-0.093	0.054	0.086	*	1007
Mayor's Age	49.192	-0.528	1.614	0.743		1015
Mayor's College	0.519	0.030	0.076	0.690		971
Party in Federal Gov. Coalition	0.702	0.049	0.067	0.468		965
Party in Gov. Coalition	0.279	-0.027	0.064	0.677		1008
Public Workers Pop. Share	6.821	-0.151	0.593	0.799		1073
Region: Center	0.067	0.000	0.040	0.992		998
Region: North	0.038	0.050	0.037	0.178		880
Region: Northeast	0.298	-0.083	0.070	0.235		909
Region: South	0.279	-0.057	0.057	0.315		1145
Region: Southeast	0.317	0.120	0.076	0.111		853
Rural Pop. Share	39.044	-3.013	3.152	0.339		1139
Same Party as Governor	0.087	0.020	0.047	0.669		885
White Mayor	0.683	-0.025	0.069	0.712		1062

Notes: Results from local linear regressions with uniform kernel. The treatment is electing a mayor with a score above the median in the national pool of candidates. The choice of the optimal bandwidth follows the MSE-minimization procedure suggested by Calonico et al. (2020).

For a robustness check, Table B.3 presents the results for vaccination outcomes using the RD regression without controls or including one set of controls at a time. The results of electing a right-wing populist mayor on vaccination outcomes are negative regardless of the specification and tend to be slightly larger in absolute terms when fewer controls are included.

One possible concern can arise if the effect is driven not by the mayor's right-wing populism but by programmatic differences between right and left-wing parties regarding health policies, such as platforms regarding the size of the economy or the degree of intervention in private affairs. To account for such a possibility, I perform the analysis excluding the parties that did not belong to the center-to-right coalition that supported Bolsonaro in the national legislature ¹² Table 2 shows that the effect of electing a right-

¹²This coalition contains 11 parties that voted in accordance with the instruction of the government whip in more than 90% of roll call votes in the Lower House, namely PSL, Patriota, DEM, PSC, Novo, PSDB, MDB, PP, Republicanos, PL, PSD e PTB (Frey, 2021).

wing populist mayor on vaccination rates is even stronger under this specification. This implies that, on average, compared to a moderate politician, a right-wing populist mayor decreases the full schedule vaccination rate by 5.2 p.p. However, the effect of such a treatment on deaths per capita in 2021 is negative and borderline significant.

The Appendix provides two additional robustness checks. Figure B.4 shows that varying the ideological cutoff to define the treatment and control groups leads to similar results in terms of magnitude and sign. Similarly, Figure B.5 shows that qualitatively the results hold when varying the bandwidth for the RD design. Overall, the evidence strongly indicates that electing a populist right-populist mayor decreases vaccination rates.

6.2 Potential Mechanisms

Anecdotal evidence may illustrate how right-populist mayors influence vaccination rates. Consider, for instance, Mayor Waguinho Carneiro of Belford Roxo, Rio de Janeiro, who ranks in the top 1% for right-wing populism. He was elected by the same party that elected Bolsonaro in 2018 (PSL). Carneiro endorsed unproven treatments like ivermectin, which he admitted to using in July 2021 (Extra, 2021). Although he initially implemented social distancing and suspended in-person classes in 2020, these measures were gradually relaxed (Globo, 2020). In March 2021, when Rio de Janeiro state mandated a 10-day lockdown to curb COVID-19's spread, Carneiro refused to comply, mentioning potential economic damage to local businesses (Hora, 2021). That month, Belford Roxo experienced a vaccine shortage due to poor organization, leading to a suspension of vaccinations in public health clinics (G1, 2021). Later, in June 2021, Carneiro himself, lacking any medical qualification, gathered crowds and administered jabs not in a health clinic but at the city hall without wearing a mask. By the end of the year, only 47.6% of the inhabitants of Belford Roxo were fully vaccinated.

Contrast such a case with Palmeira das Missões, a municipality in the conservative state of Rio Grande do Sul (RS) run by Mayor Eduardo Freire of the Workers' Party (PT). Ranking in the 12th percentile for right-wing populism, Freire demonstrated a

commitment to rigorous health protocols. He advocated for continued social distancing and openly criticized the premature easing of restrictions by Rio Grande do Sul's governor, Eduardo Leite (CPERS, 2021; Famurs, 2021). Leading the state federation of municipalities, he urged his fellow mayors to adhere to science-based pandemic responses. Consequently, by the end of 2021, Palmeira das Missões had fully vaccinated 77.5% of its population.

The contrasting actions of mayors like Carneiro and Freire highlight the impact of local political leadership on public health. The erratic actions of right-populist mayors like Carneiro confused citizens. Populists' mixed messages about the pandemic's severity complicate public understanding and adherence to health guidelines. Additionally, effective vaccination campaigns require meticulous planning based on vaccine supply forecasts and appropriate scheduling. For instance, Sinovac's second dose should be administered 15 to 28 days after the first, whereas AstraZeneca and Pfizer's can wait up to 90 days. Mayors who received higher supplies of Sinovac should have used half of the units in order to have enough vaccines for the second round. Mayors who got vaccines from other manufacturers could vaccinate more aggressively while waiting to receive more shipments.

There were substantial informational costs related to COVID-19 vaccination in Brazil, where citizens had to understand when they were eligible to head to a public health clinic and get a shot. The lack of federal coordination confused citizens about diverging policies among different states and municipalities. Mayors need to clearly inform their population in order to achieve high vaccination coverage. Right-populist mayors are less likely to commit to such discipline.

Consistent with this argument, there is evidence that citizens sought immunization in neighboring municipalities where vaccination campaigns were better managed (Fundação Oswaldo Cruz, 2021). To capture this mechanism, I construct a measure of external vaccine demand at the municipality level. Specifically, I calculate the difference between the total number of vaccine doses administered in a municipality and the number of doses administered to its own residents, scaled by population. Positive values indicate a net inflow of non-residents seeking vaccination, whereas negative values indicate that

Table 4: Possible Mechanisms

Outcome	Year	Control Mean	LATE	SE	P-value	Bandwidth	N
External Demand: First Dose	2021	-0.028	-0.016	0.013	0.206	0.161	947
External Demand: First Dose	2022	-0.001	-0.003	0.002	0.167	0.144	867
External Demand: First Dose	2023	0.000	0.000	0.001	0.919	0.127	796
External Demand: Second Dose	2021	-0.023	-0.017	0.009	0.066 *	0.192	1057
External Demand: Second Dose	2022	-0.001	-0.005	0.002	0.042 **	0.146	875
External Demand: Second Dose	2023	0.000	0.000	0.001	0.579	0.151	900
External Demand: Full Schedule	2021	-0.024	-0.017	0.010	0.072 *	0.195	1065
External Demand: Full Schedule	2022	-0.001	-0.005	0.002	0.040 **	0.146	873
External Demand: Full Schedule	2023	0.000	0.000	0.001	0.622	0.131	817
External Demand: All Doses	2021	-0.050	-0.039	0.023	0.091 *	0.185	1034
External Demand: All Doses	2022	-0.008	-0.013	0.011	0.219	0.156	921
External Demand: All Doses	2023	0.001	-0.004	0.004	0.330	0.150	896
Log GDP	2021	19.459	-0.008	0.029	0.775	0.142	847
Log Health Spending	2021	16.237	0.028	0.033	0.398	0.140	834
Log Health Spending	2022	16.460	-0.016	0.027	0.565	0.186	1028

Notes: Results from local linear regressions with triangular kernel. The treatment is electing a mayor with a score above the median in the national pool of candidates. The choice of the optimal bandwidth follows the MSE-minimization procedure suggested by Calonico et al. (2020).

residents are more likely to seek vaccination elsewhere.

Table 4 provides suggestive evidence that right-wing populist mayors manage vaccination campaigns less effectively. In both 2021 and 2022, municipalities governed by right-populist mayors exhibit lower external demand for second doses and full vaccination, indicating reduced inflows of non-residents seeking vaccination services.

One possible concern arises if right-populist mayors reduce spending due to programmatic idiosyncrasies regarding health policies. Table 4 presents some evidence that this is unlikely because treated municipalities do not significantly differ in the amount of health spending. Another potential concern would be if the results were driven by right-wing mayors being simply less competent. That is unlikely since I control for the mayor’s college education. Table 4 also shows that the control and treatment groups do not present significant differences in terms of GDP.

7 Conclusion

Far-right populists often adopt anti-science rhetoric to raise political support by pitting the people against the elites and experts (Ajzenman et al., 2023; Lasco, 2020). They

frequently engage in medical populism, dramatizing health crises and proposing simplistic solutions to complex health problems (Lasco and Curato, 2019). There is substantial evidence linking right-wing populism to vaccine hesitancy (Hornsey et al., 2020; Kohler and Koinig, 2023; Kreps and Kriner, 2023; Peixoto et al., 2023; Recio-Román et al., 2021) and low adherence to social distancing preventive measures (Ajzenman et al., 2023; Ash et al., 2023).

This study contributes to this literature by investigating how local leaders propagate the influence of right-wing populism on health policies. I document a significant and robust decrease in COVID-19 vaccination in Brazilian municipalities governed by right-populist mayors. This effect persists even when excluding municipalities led by leftist parties that opposed Bolsonaro at the federal level. In other words, even in a comparison between a centrist or moderate-right mayor and a right-wing populist mayor, there is a negative difference in vaccination rates. Such an effect is consistent with right-wing populist mayors' reduced engagement in vaccination efforts and mixed signals regarding the severity of the COVID-19 pandemic.

Nonetheless, the evidence does not indicate that electing a right-wing populist mayor affects COVID-19 cases and deaths, partly because of the limited reliability of testing data in Brazil. It is plausible that right-populist mayors have little incentive to conduct testing, potentially to conceal the adverse outcomes of their policies.

While the impact of national populist leaders on policy outcomes has been extensively studied, the role of local politicians in federal systems destabilized by national populists has received less attention. The results presented here have important ramifications for research on the consequences of populism. The effects described here may shed light on similar patterns in other decentralized political systems and in other contested policy fields such as health, immigration, environmental conservation, gender, and LGBT rights.

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A Words Associated with Ideological Classification

Table A.1: Top Words Associated with the Populist Right

Token	Translation	Likelihood	Ratio	Ideology
acima	above	0.9981	17.98	right
meritocracia	meritocracy	0.9996	11.20	right
publico_privado	public_private	0.9996	9.19	right
startups	startups	0.9997	8.31	right
ideologia	ideology	0.9996	7.82	right
corrupcao	corruption	0.9990	7.45	right
desburocratizar	reduce bureaucracy	0.9997	6.71	right
civico-militar	civic-military	0.9997	6.69	right
pos_pandemia	post-pandemic	0.9997	6.21	right
confianca	trust	0.9997	6.18	right
alvaras	city permits	0.9997	5.98	right
iremos	we will	0.9998	5.91	right
vocacoes	vocations	0.9998	5.77	right
algumas_acoes	some actions	0.9998	5.65	right
finalizar	to finish	0.9998	5.63	right
disponibilizar	to make available	0.9996	5.58	right
introducao	introduction	0.9997	5.56	right
licenciamento	licensing	0.9997	5.43	right
burocracia	bureaucracy	0.9998	5.20	right
paralelo	parallel	0.9998	5.17	right
atrativos	attractive	0.9997	5.15	right
secretario	secretary	0.9997	5.07	right
governos_estadual	state government	0.9997	5.02	right
boas	good	0.9998	5.01	right
poder_executivo	Executive power	0.9997	4.89	right
naquele	in that	0.9998	4.88	right
gestao_eficiente	efficient management	0.9996	4.82	right
fraudes	frauds	0.9998	4.81	right
parcerias_publico-privadas	public-private partnerships	0.9998	4.77	right
ordem_publica	public order	0.9998	4.74	right
escolas_publicas_municipais	municipal public schools	0.9997	4.62	right
embarque	boarding	0.9998	4.59	right
entidades_publicas	public entities	0.9998	4.56	right
maquina_publica	public apparatus	0.9997	4.55	right
quarto	fourth	0.9997	4.55	right
negocios	business	0.9989	4.52	right
not_administracao_publica	not_public administration	0.9998	4.50	right
berco	cradle	0.9998	4.49	right
governo_prefeitura	city hall government	0.9998	4.49	right
novas_oportunidades	new opportunities	0.9998	4.43	right
comercial	commercial	0.9997	4.41	right
redirecionamento	redirection	0.9998	4.38	right
parcerias_publico-privadas	public-private partnerships	0.9998	4.36	right
centro_historico	historic center	0.9998	4.36	right
racionalizacao	rationalization	0.9998	4.33	right
not_eficientes	not_efficient	0.9998	4.29	right
remodelar	remodel	0.9998	4.29	right
transportes_coletivos	public transportation	0.9998	4.29	right
federal	federal	0.9994	4.25	right
deus	god	0.9998	4.25	right

Notes: Likelihood is the likelihood of a token given the class **right**, i.e. $P(w|right)$. Ratio is the ratio of token-likelihoods $\frac{P(w|right)}{P(w|left)}$. A token is classified as “right” when the likelihood ratio is higher than one and “left” otherwise. The table displays the 50 words with the highest ratio.

Table A.2: Top Words Associated with the Left

Token	Translation	Likelihood	Ratio	Ideology
not_parte	not_part	0.0023	0.02	left
not_municipal	not_municipal	0.0011	0.04	left
coligacao	coalition	0.0020	0.05	left
majoritaria	majoritarian	0.0008	0.05	left
diretorio	directory	0.0008	0.06	left
not_bem	not_good	0.0008	0.06	left
not_muitos	not_many	0.0007	0.07	left
pontos_estrategicos	strategic points	0.0007	0.07	left
not_trabalho	not_labor	0.0015	0.08	left
pccr	Career and compensation plan	0.0008	0.09	left
candidatura	candidacy	0.0012	0.10	left
justica_eleitoral	Electoral Justice	0.0004	0.10	left
not_ideia	not_idea	0.0004	0.10	left
not_justica	not_justice	0.0004	0.10	left
psf	National Family Health Program	0.0004	0.10	left
not_novo	not_new	0.0004	0.10	left
provisoria	temporary	0.0004	0.10	left
comissao_provisoria	temporary commission	0.0004	0.10	left
not_procurador	not_prosecutor	0.0004	0.10	left
not_fiscal	not_fiscal	0.0004	0.10	left
not_documentos	not_documents	0.0004	0.10	left
not_executivo	not_executive	0.0004	0.10	left
not_junto	not_together	0.0004	0.10	left
seriedade	seriousness	0.0004	0.11	left
not_visando	not_aiming	0.0004	0.12	left
marcha	march	0.0004	0.12	left
not_parceria	not_partnership	0.0004	0.12	left
not_mercado	not_market	0.0004	0.12	left
comunidades_ribeirinhas	riverside populations	0.0004	0.12	left
not_vida	not_life	0.0008	0.12	left
not_vinculado	not_bound	0.0004	0.12	left
not_criar	not_create	0.0004	0.13	left
partidaria	partisan	0.0004	0.13	left
not_brasil	not_Brazil	0.0008	0.13	left
not_gratuita	not_free	0.0004	0.13	left
not_eleitoral	not_electoral	0.0004	0.13	left
amanha	tomorrow	0.0004	0.13	left
democratizacao	democratization	0.0005	0.13	left
demais_servidores	other public servers	0.0004	0.13	left
raca	race	0.0005	0.13	left
not_periodos	not_time periods	0.0004	0.14	left
invasoes	invasion	0.0004	0.14	left
justica	justice	0.0005	0.14	left
judicial	judicial	0.0004	0.14	left
sus	National Health System	0.0006	0.14	left
not_lei	not_law	0.0004	0.14	left
not_esporte	not_sport	0.0004	0.14	left
inclusiva	inclusive	0.0004	0.16	left
democratica	democratic	0.0009	0.16	left
not_popular	not_popular	0.0004	0.16	left

Notes: Likelihood is the likelihood of a token given the class **right**, i.e. $P(w|right)$. Ratio is the ratio of token-likelihoods $\frac{P(w|right)}{P(w|left)}$. A token is classified as “right” when the likelihood ratio is higher than one and “left” otherwise. The table displays the 50 words with the lowest ratio.

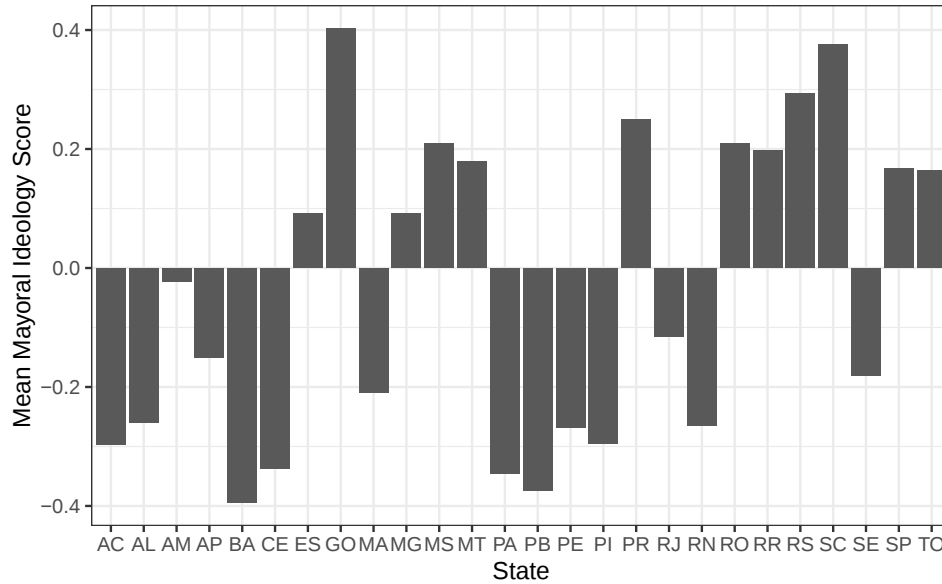
Table A.3: Ideology of Selected Words

Token	Translation	Likelihood	Ratio	Ideology
movimentos_sociais	social movements	0.0002	0.00	left
agroecologia	agroecology	0.0002	0.00	left
transicao_ecologica	ecologic transition	0.0002	0.00	left
desigualdades_sociais	social inequalities	0.0002	0.00	left
dilma	Dilma	0.0001	0.00	left
socioambiental	socioenvironmental	0.0001	0.00	left
comunidades_tradicionalis	traditional communities	0.0001	0.00	left
etica	ethics	0.0003	0.00	left
povos_indigenas	indigenous populations	0.0001	0.00	left
precarizados	precarious	0.0001	0.00	left
renda_basica	basic income	0.0001	0.00	left
lula	Lula	0.0001	0.00	left
bolsa_familia	National Cash Transfer Program	0.0002	0.00	left
juventude_negra	black youth	0.0001	0.00	left
familias_vulneraveis	vulnerable families	0.0001	0.00	left
mudancas_climaticas	climate change	0.0001	0.00	left
terceirizacoes	outsourcing	0.0001	0.00	left
iptu_progressivo	progressive real property tax	0.0001	0.00	left
isolamento_social	social distancing	0.0001	0.00	left
fome	hunger	0.0001	0.00	left
<local>	<local>	0.0183	0.02	left
educacao	education	0.0032	0.00	left
dinheiro_publico	public resources	0.0001	0.00	left
auxilio_emergencial	stimulus checks	0.0000	0.00	right
sustentavel	sustainable	0.0002	0.00	right
desigualdades_extremas	extreme inequalities	0.0000	0.00	right
reduzida_taxa	reduced tax	0.0000	0.00	right
altamente_competitivo	highly competitive	0.0000	0.00	right
fanfarra_municipal	municipal marching band	0.0000	0.00	right
gestao_profissional_eficiente	efficient and professional management	0.0000	0.00	right
atraira_investimentos	will attract investments	0.0000	0.00	right
garantindo_employabilidade	securing employability	0.0000	0.00	right
festas_tradicionalis_culturais	cultural traditional festivals	0.0000	0.00	right
espacos_poliesportivos	multi-sport stadiums	0.0000	0.00	right
saude	health	0.0000	0.00	right
gestao_orcamentaria_financeira	budgetary management	0.0000	0.00	right
consumo_responsavel	responsible consumption	0.0000	0.00	right
tecnico-profissionais	technical professional	0.0000	0.00	right
efetivo_policial	police workforce	0.0000	0.00	right
governo_federal	federal government	0.0005	0.00	right
bolsonaro	Bolsonaro	0.0001	0.00	right
igrejas	churches	0.0001	0.00	right
livre_iniciativa	free initiative	0.0000	0.00	right
recursos_publicos	public resources	0.0003	0.00	right
policia_militar	military police	0.0001	0.00	right
patria	nation	0.0000	0.00	right
empreendedorismo	entrepreneurship	0.0003	0.00	right
inflacao	inflation	0.0001	0.00	right
moralidade	morality	0.0001	0.00	right
cristao	christian	0.0000	0.00	right
cidade_inteligente	smart city	0.0001	0.00	right
deus	god	0.0001	0.00	right
corrupcao	corruption	0.0001	0.00	right

Notes: Likelihood is the likelihood of a token given the class **right**, i.e. $P(w|right)$. Ratio is the ratio of token-likelihoods $\frac{P(w|right)}{P(w|left)}$. A token is classified as “right” when the likelihood ratio is higher than one and “left” otherwise.

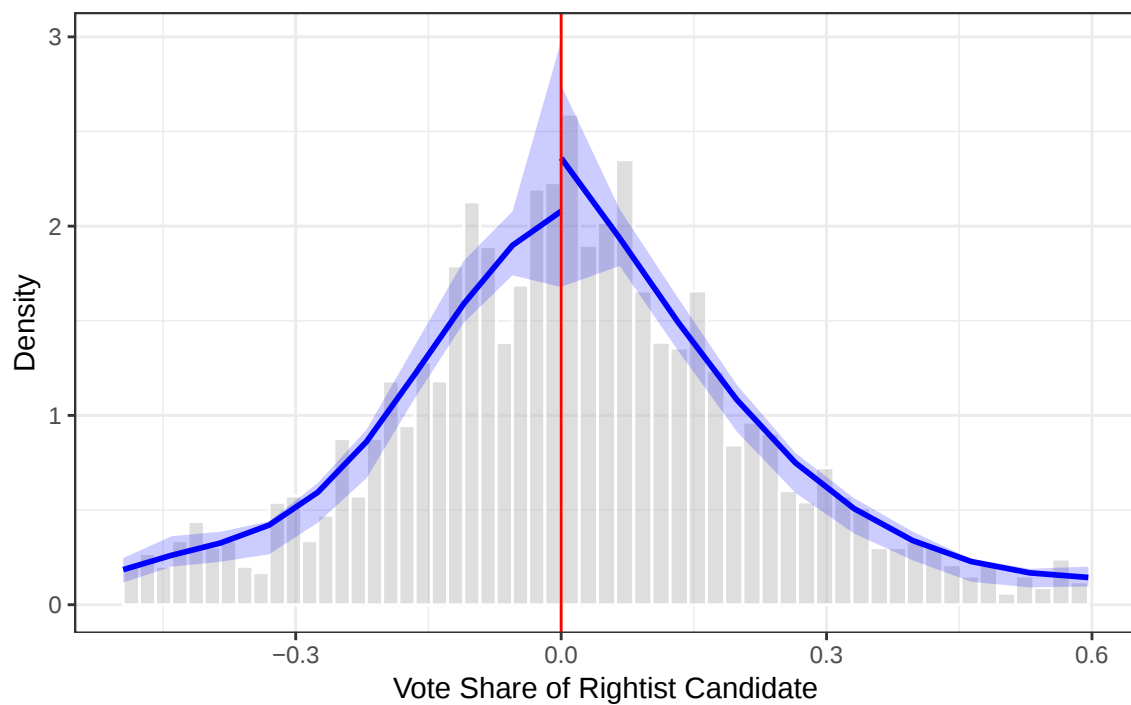
B Supplementary Results

Figure B.2: Mean Mayoral Candidates' Ideology by State



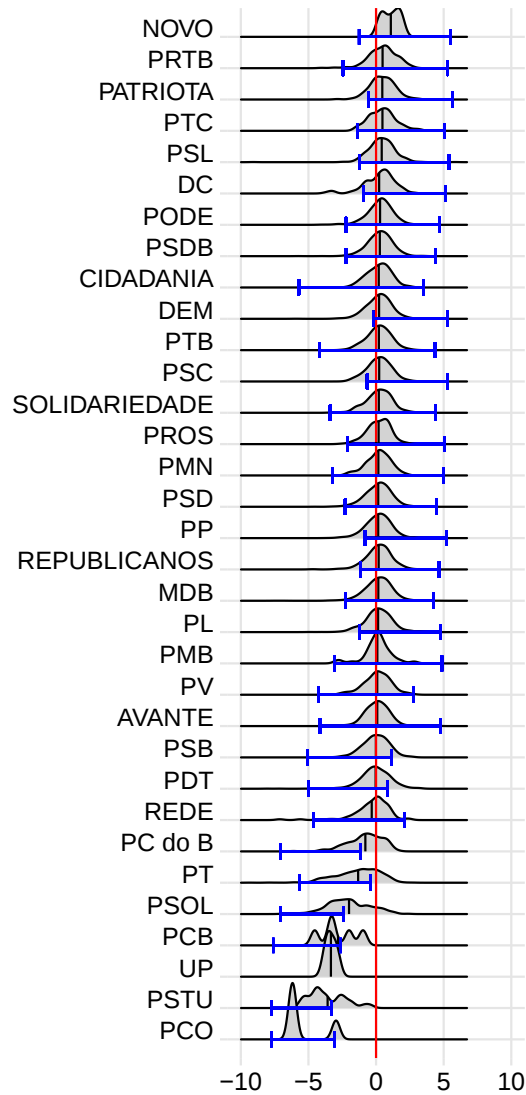
Notes: Each bar represents the average mayoral candidate's ideological score within a Brazilian state.

Figure B.3: Manipulation Test



Notes: The p-value of the test statistic for density discontinuity suggested by Cattaneo et al. (2018) is 0.793.

Figure B.1: Kernel Density of Mayoral Candidates' Right-Populism Score by Party



Notes: Each density plot represents the mayoral candidates' right-populism score distribution within a different party. These estimates range from -35.3 to 11.9, but the graph excludes outliers beyond the range of -10 to 10 for better visualization. Vertical bars represent party means. Blue horizontal bars represent the 95% confidence interval of national expert-based ideology measures available from Bolognesi et al. (2022). The correlation between the party means across the two measures is 0.84. The expert-based measure for UP is unavailable because it was founded after the data collection of the cited study.

Table B.1: Descriptive Statistics: Close-Elections Sample

Variable	Mean	St. Dev.	Min	Max	N
Illiteracy Rate	15.996	9.704	1.050	43.890	894
Average Education	9.432	1.160	4.340	12.530	894
Gini Inequality	0.495	0.066	0.280	0.780	894
Log Income per Capita	6.074	0.497	4.798	7.457	894
Elderly Pop. Share	8.388	2.380	2.146	16.758	894
Rural Pop. Share	37.241	22.381	0.000	90.920	894
Female Pop. Share	49.466	1.422	38.709	53.314	894
Public Workers Pop. Share	6.585	4.140	0.000	36.910	894
Region: South	0.235	0.424	0.000	1.000	894
Region: North	0.078	0.269	0.000	1.000	894
Region: Northeast	0.299	0.458	0.000	1.000	894
Region: Center	0.063	0.242	0.000	1.000	894
Region: Southeast	0.326	0.469	0.000	1.000	894
Log Population	9.416	1.112	7.281	14.782	894
Log GDP 2019	19.269	1.349	16.838	24.934	894
Log GDP 2021	19.527	1.359	16.994	25.020	894
Log Total Cases of COVID-19 Before 2020 Election	5.264	1.566	0.693	11.022	894
Log Total Deaths of COVID-19 Before 2020 Election	1.737	1.304	0.000	8.273	894
Bolsonaro's Vote Share 2018	0.464	0.217	0.056	0.894	894
Same Party as Governor	0.115	0.319	0.000	1.000	894
Incumbent Mayor	0.291	0.454	0.000	1.000	894
Party in Gov. Coalition	0.274	0.446	0.000	1.000	894
Mayor's College	0.553	0.498	0.000	1.000	894
Male Mayor	0.860	0.347	0.000	1.000	894
Mayor's Age	49.849	11.252	21.000	88.000	894
White Mayor	0.681	0.466	0.000	1.000	894
Party in Federal Gov. Coalition	0.704	0.457	0.000	1.000	894
First-Dose Shots per Capita	0.773	0.150	0.138	1.775	894
Second-Dose Shots per Capita	0.663	0.151	0.090	1.430	894
All-Doses per Capita	1.590	0.347	0.299	3.406	894
Full-Schedule per Capita	0.684	0.154	0.104	1.456	894
New Cases per Capita	0.089	0.042	0.002	0.286	894
New Deaths per Capita	0.007	0.005	0.000	0.036	894
External Demand: First Dose	-0.030	0.124	-0.748	1.032	894
External Demand: Second Dose	-0.024	0.099	-0.592	0.780	894
External Demand: Full Schedule	-0.024	0.101	-0.594	0.794	894
External Demand: All Doses	-0.053	0.232	-1.352	1.833	894
Log Health Spending 2021	16.335	0.980	14.343	21.601	889
Log Health Spending 2022	16.542	0.943	14.826	21.678	890
# Months until 70% 1st-Dose Vaccination	3.121	8.017	1.000	36.000	894
# Months until 70% 2nd-Dose Vaccination	6.919	12.549	1.000	36.000	894
# Months until 70% Full Vaccination	6.060	11.807	1.000	36.000	894

Notes: Sample only includes elections where the top 2 dispute was between a right-populist mayor and a non-right-populist mayor and the absolute margin of victory was less than 0.15.

Table B.2: Comparison Between Full Sample and Close-Elections Sample

Variable	Full Sample		Close-Elections		Difference in Means	P-value
	Mean	N	Mean	N		
Illiteracy Rate	16.099	4494	16.002	641	-0.097	0.808
Average Education	9.444	4494	9.459	641	0.015	0.749
Gini Inequality	0.495	4494	0.496	641	0.001	0.728
Log Income per Capita	6.082	4494	6.059	641	-0.023	0.269
Elderly Pop. Share	8.362	4494	8.344	641	-0.017	0.869
Rural Pop. Share	36.026	4494	37.477	641	1.451	0.125
Female Pop. Share	49.531	4494	49.432	641	-0.099	0.107
Public Workers Pop. Share	6.644	4494	6.991	641	0.346	0.084
Region: South	0.214	4499	0.215	641	0.001	0.933
Region: North	0.082	4499	0.087	641	0.005	0.680
Region: Northeast	0.322	4499	0.310	641	-0.011	0.568
Region: Center	0.083	4499	0.089	641	0.006	0.603
Region: Southeast	0.299	4499	0.298	641	-0.001	0.941
Log Population	9.493	4499	9.408	641	-0.085	0.079
Log GDP 2019	19.338	4499	19.229	641	-0.109	0.051
Log GDP 2021	19.595	4499	19.486	641	-0.109	0.051
Log Total Cases of COVID-19 Before 2020 Election	5.392	4499	5.300	641	-0.091	0.174
Log Total Deaths of COVID-19 Before 2020 Election	1.823	4499	1.763	641	-0.060	0.283
Bolsonaro's Vote Share 2018	0.466	4499	0.464	641	-0.002	0.798
Same Party as Governor	0.141	4499	0.131	641	-0.010	0.471
Incumbent Mayor	0.382	4499	0.262	641	-0.120	0.000
Party in Gov. Coalition	0.285	4499	0.289	641	0.003	0.867
Mayor's College	0.564	4499	0.540	641	-0.024	0.248
Male Mayor	0.877	4499	0.850	641	-0.026	0.077
Mayor's Age	49.177	4499	49.390	641	0.213	0.653
White Mayor	0.665	4499	0.661	641	-0.004	0.841
Party in Federal Gov. Coalition	0.748	4499	0.707	641	-0.041	0.032
First-Dose Shots per Capita	0.782	4499	0.769	641	-0.012	0.074
Second-Dose Shots per Capita	0.669	4499	0.658	641	-0.011	0.109
All-Doses per Capita	1.608	4499	1.583	641	-0.026	0.108
Full-Schedule per Capita	0.691	4499	0.679	641	-0.012	0.098
New Cases per Capita	0.089	4499	0.089	641	0.000	0.996
New Deaths per Capita	0.007	4499	0.008	641	0.000	0.298
External Demand: First Dose	-0.028	4499	-0.028	641	0.001	0.924
External Demand: Second Dose	-0.023	4499	-0.023	641	0.000	0.979
External Demand: Full Schedule	-0.024	4499	-0.024	641	0.000	0.959
External Demand: All Doses	-0.050	4499	-0.050	641	0.000	0.972
Log Health Spending 2021	16.414	4474	16.324	635	-0.090	0.030
Log Health Spending 2022	16.617	4462	16.536	635	-0.081	0.041
# Months until 70% 1st-Dose Vaccination	3.053	4499	3.540	641	0.487	0.181
# Months until 70% 2nd-Dose Vaccination	7.094	4499	7.769	641	0.676	0.227
# Months until 70% Full Vaccination	6.194	4499	6.626	641	0.432	0.406

Notes: Close-Elections sample only includes elections where the top 2 dispute was between a right-populist mayor and a non-right-populist mayor, and the absolute margin of victory was less than 0.03. P-value refers to the Welch's t-test statistic for the difference in means.

Table B.3: Effect of Electing a Right-Populist Mayor on Vaccination with Different Sets of Controls

Outcome	Year	covariates	LATE	SE	P-value		Bandwidth	N
All-Doses per Capita	2021	No Controls	-0.095	0.050	0.055	*	0.138	832
First-Dose Shots per Capita	2021	No Controls	-0.043	0.020	0.031	**	0.134	823
Full-Schedule per Capita	2021	No Controls	-0.044	0.022	0.041	**	0.140	839
Second-Dose Shots per Capita	2021	No Controls	-0.043	0.021	0.043	**	0.141	841
All-Doses per Capita	2021	Municipality Ctrls.	-0.072	0.030	0.017	**	0.141	840
First-Dose Shots per Capita	2021	Municipality Ctrls.	-0.035	0.014	0.015	**	0.133	821
Full-Schedule per Capita	2021	Municipality Ctrls.	-0.034	0.014	0.011	**	0.146	873
Second-Dose Shots per Capita	2021	Municipality Ctrls.	-0.034	0.013	0.012	**	0.149	890
All-Doses per Capita	2021	Political Ctrls.	-0.102	0.044	0.022	**	0.136	825
First-Dose Shots per Capita	2021	Political Ctrls.	-0.045	0.018	0.011	**	0.131	815
Full-Schedule per Capita	2021	Political Ctrls.	-0.048	0.019	0.012	**	0.138	829
Second-Dose Shots per Capita	2021	Political Ctrls.	-0.046	0.019	0.016	**	0.140	838
All-Doses per Capita	2021	Party FE	-0.108	0.048	0.023	**	0.122	770
First-Dose Shots per Capita	2021	Party FE	-0.048	0.019	0.012	**	0.120	758
Full-Schedule per Capita	2021	Party FE	-0.049	0.021	0.018	**	0.126	792
Second-Dose Shots per Capita	2021	Party FE	-0.048	0.020	0.018	**	0.127	797
All-Doses per Capita	2021	State FE	-0.062	0.036	0.085	*	0.142	848
First-Dose Shots per Capita	2021	State FE	-0.033	0.015	0.032	**	0.126	792
Full-Schedule per Capita	2021	State FE	-0.029	0.015	0.048	**	0.146	873
Second-Dose Shots per Capita	2021	State FE	-0.027	0.015	0.060	*	0.149	887
All-Doses per Capita	2022	No Controls	-0.050	0.037	0.172		0.148	883
First-Dose Shots per Capita	2022	No Controls	-0.002	0.005	0.623		0.141	842
Full-Schedule per Capita	2022	No Controls	-0.008	0.006	0.129		0.142	844
Second-Dose Shots per Capita	2022	No Controls	-0.008	0.005	0.141		0.145	868
All-Doses per Capita	2022	Municipality Ctrls.	-0.041	0.034	0.237		0.151	901
First-Dose Shots per Capita	2022	Municipality Ctrls.	-0.003	0.004	0.467		0.148	882
Full-Schedule per Capita	2022	Municipality Ctrls.	-0.008	0.005	0.103		0.146	875
Second-Dose Shots per Capita	2022	Municipality Ctrls.	-0.008	0.005	0.113		0.150	894
All-Doses per Capita	2022	Political Ctrls.	-0.039	0.035	0.261		0.141	840
First-Dose Shots per Capita	2022	Political Ctrls.	-0.001	0.004	0.831		0.135	824
Full-Schedule per Capita	2022	Political Ctrls.	-0.006	0.005	0.199		0.132	820
Second-Dose Shots per Capita	2022	Political Ctrls.	-0.006	0.005	0.218		0.135	825
All-Doses per Capita	2022	Party FE	-0.062	0.035	0.079	*	0.142	843
First-Dose Shots per Capita	2022	Party FE	-0.005	0.005	0.292		0.138	829
Full-Schedule per Capita	2022	Party FE	-0.010	0.005	0.060	*	0.139	836
Second-Dose Shots per Capita	2022	Party FE	-0.010	0.005	0.065	*	0.141	841
All-Doses per Capita	2022	State FE	0.002	0.028	0.955		0.143	860
First-Dose Shots per Capita	2022	State FE	0.001	0.004	0.814		0.142	844
Full-Schedule per Capita	2022	State FE	-0.003	0.005	0.496		0.146	876
Second-Dose Shots per Capita	2022	State FE	-0.003	0.005	0.514		0.149	887
All-Doses per Capita	2023	No Controls	-0.014	0.018	0.423		0.137	828
First-Dose Shots per Capita	2023	No Controls	-0.002	0.002	0.458		0.111	712
Full-Schedule per Capita	2023	No Controls	-0.001	0.002	0.543		0.127	797
Second-Dose Shots per Capita	2023	No Controls	-0.001	0.002	0.648		0.128	802
All-Doses per Capita	2023	Municipality Ctrls.	-0.016	0.017	0.359		0.138	829
First-Dose Shots per Capita	2023	Municipality Ctrls.	-0.002	0.002	0.387		0.123	770
Full-Schedule per Capita	2023	Municipality Ctrls.	-0.001	0.002	0.588		0.146	875
Second-Dose Shots per Capita	2023	Municipality Ctrls.	-0.001	0.002	0.521		0.131	817
All-Doses per Capita	2023	Political Ctrls.	-0.011	0.017	0.506		0.129	805
First-Dose Shots per Capita	2023	Political Ctrls.	-0.001	0.002	0.617		0.117	748
Full-Schedule per Capita	2023	Political Ctrls.	-0.001	0.002	0.717		0.131	817
Second-Dose Shots per Capita	2023	Political Ctrls.	-0.001	0.002	0.720		0.121	761
All-Doses per Capita	2023	Party FE	-0.016	0.018	0.361		0.129	804
First-Dose Shots per Capita	2023	Party FE	-0.003	0.003	0.299		0.107	687
Full-Schedule per Capita	2023	Party FE	-0.002	0.002	0.278		0.119	754
Second-Dose Shots per Capita	2023	Party FE	-0.001	0.002	0.525		0.123	770
All-Doses per Capita	2023	State FE	0.003	0.016	0.874		0.141	840
First-Dose Shots per Capita	2023	State FE	0.001	0.002	0.623		0.125	782
Full-Schedule per Capita	2023	State FE	0.001	0.002	0.518		0.130	808
Second-Dose Shots per Capita	2023	State FE	0.001	0.002	0.524		0.135	825

Table B.4: Balance Tests: Party and State Fixed Effects

Outcome	LATE	SE	P-value	s	N
Party: AVANTE	0.015	0.014	0.284		1011
Party: CIDADANIA	-0.018	0.023	0.450		1056
Party: DEM	-0.027	0.046	0.556		869
Party: MDB	-0.024	0.051	0.632		1027
Party: PATRIOTA	0.009	0.017	0.594		1004
Party: PC do B	-0.004	0.003	0.101		645
Party: PDT	-0.019	0.035	0.582		992
Party: PL	-0.030	0.033	0.364		1074
Party: PMN	0.003	0.016	0.871		1074
Party: PODE	0.026	0.024	0.270		1126
Party: PP	0.004	0.043	0.924		976
Party: PROS	-0.044	0.017	0.009	***	778
Party: PSB	-0.002	0.029	0.951		979
Party: PSC	-0.020	0.023	0.384		948
Party: PSD	0.026	0.048	0.591		1016
Party: PSDB	0.015	0.038	0.688		1095
Party: PSL	-0.002	0.016	0.896		807
Party: PSOL	-0.005	0.005	0.317		1291
Party: PT	-0.044	0.032	0.169		865
Party: PTB	0.057	0.036	0.118		977
Party: PV	0.012	0.017	0.477		1175
Party: REDE	-0.003	0.003	0.355		1602
Party: REPUBLICANOS	0.051	0.031	0.100		957
Party: SOLIDARIEDADE	0.025	0.023	0.269		1178
State: AC	0.000	0.001	0.689		497
State: AL	-0.010	0.020	0.621		927
State: AM	0.018	0.008	0.017	**	1034
State: AP	-0.013	0.011	0.232		763
State: BA	0.018	0.030	0.547		998
State: CE	-0.002	0.019	0.917		856
State: ES	-0.014	0.015	0.342		1073
State: GO	-0.009	0.031	0.760		1088
State: MA	0.029	0.025	0.239		1140
State: MG	0.061	0.058	0.297		992
State: MS	0.014	0.016	0.384		1088
State: MT	0.000	0.016	0.988		1065
State: PA	0.040	0.024	0.103		842
State: PB	-0.019	0.024	0.431		992
State: PE	-0.016	0.027	0.544		1035
State: PI	-0.024	0.027	0.369		1108
State: PR	-0.021	0.035	0.557		962
State: RJ	0.053	0.026	0.043	**	1016
State: RN	-0.030	0.025	0.242		1063
State: RO	0.001	0.012	0.925		998
State: RR	-0.001	0.010	0.913		1077
State: RS	-0.040	0.044	0.371		1035
State: SC	-0.025	0.034	0.475		1218
State: SE	-0.038	0.025	0.131		1001
State: SP	-0.003	0.046	0.949		1005
State: TO	0.005	0.018	0.790		882

Notes: Results from local linear regressions with uniform kernel. Treatment is electing a mayor among the 50% most rightists in the national pool of candidates. The choice of the optimal bandwidth follows the procedure suggested by Calonico et al. (2020).

Figure B.4: Robustness Check: LATE on Vaccination Rates for Different Treatment Definitions

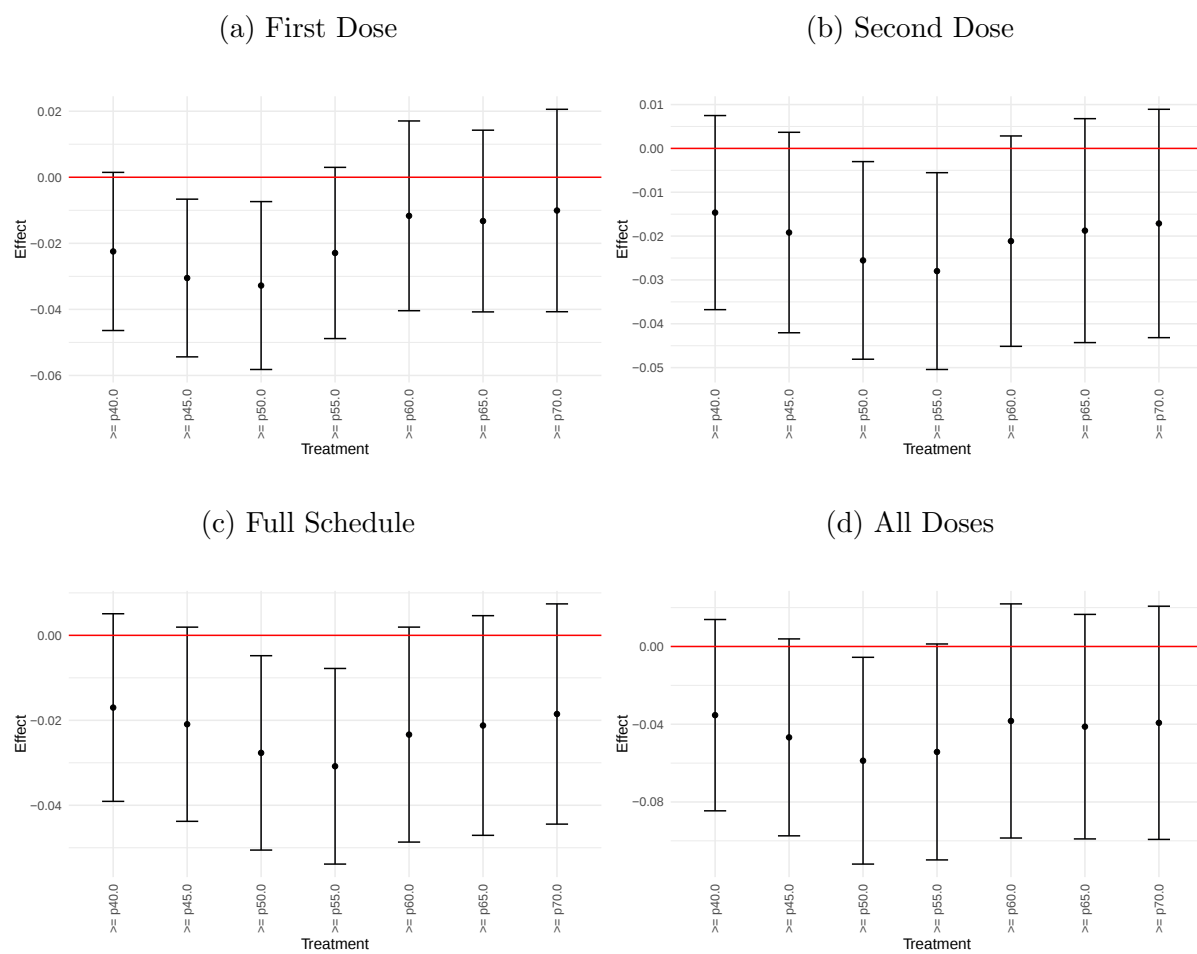


Figure B.5: Robustness Check: LATE on Vaccination Rates for Varying Bandwidths

