When Crisis Hits, Does Experience Matter? Evidence from COVID-19 vaccination

Anderson Frey* & Jefferson Leal†

Abstract

Politicians often highlight prior office experience to appeal to voters, who seem to value this attribute. However, the role of political experience in determining actual policy outcomes remains overlooked by the literature, particularly during times of crisis when experience becomes uniquely salient to voters. This article examines how political experience affects policy implementation during a crisis using data on COVID vaccinations across Brazilian municipalities in 2021. It shows that vaccination rates were 12% higher in cities governed by incumbent mayors that were reelected in Nov 2020–and already had extensive experience managing the pandemic–when compared to cities that elected newcomers. These effects cannot be attributed to bureaucratic turnover or differences in reelection incentives. They are also concentrated in municipalities severely affected by the pandemic earlier in 2020, supporting the argument that early crisis management experience through learning-by-doing significantly enhanced mayors' performance during the vaccine rollout.

*Department of Political Science, University of Rochester. Email: anderson.frey@rochester.edu.
†Department of Political Science, University of Rochester. Email: jefferson.leal@rochester.edu.

"Experience is what makes the difference in a crisis moment" was the opening statement of incumbent mayor and reelection candidate Bruno Covas at the first debate of the 2020 election in São Paulo, Brazil's largest city. At first, this might seem like a commonplace statement for an incumbent. Politicians often use previous office experience to appeal to voters, and voters typically value it (Abramowitz, 1988; CNI, 2018; Fowler et al., 2023; Portmann, 2022). However, Mr. Covas had never occupied an elected position before and only became mayor two years earlier when the previous incumbent resigned to run for state governor.[1] His claim to crisis management experience was solely based on the fact that he had run the city during the first eight months of the pandemic and thus was the only one with the "appropriate" experience to do so in 2021-2024, something he reinforced throughout his campaign.

The prevailing argument connecting administrative experience to better performance in office is one of learning by doing: incumbents acquire unique and specific skills during their tenure, which allows them to perform better in the future (Dal Bó and Rossi, 2011; Miquel and Snyder Jr, 2006), especially compared to newcomers whose previous experiences outside the public sector might not transfer (Lewis, 2007).[2] What is more, experience acquired in times of unprecedented crises—such as financial meltdowns, natural disasters, or pandemics—is likely to be salient in reelection campaigns of incumbents, given the unique character of the expertise and the salience of the issue among voters.[3]

In this context, we examine the broad question of whether office experience acquired during a crisis improves the efficacy of politicians, in line with the well-documented conventional wisdom from incumbents' claims and voters' expectations. The literature provides limited evidence that experience drives good policies, even in normal times (Miquel and Snyder Jr, 2006). This might be due, in part, to the difficulty of empirically disentangling the effects of positive selection and experience on policy performance (Alt, Bueno de Mesquita, and Rose, 2011). Moreover, experience can be a "double-edged sword" (Tsur, 2022), and learning by doing could also facilitate malfeasance (Chaudhuri et al., 2024; Coviello and Gagliarducci, 2017).

[1] Mr. Covas was the vice-mayor in the ticket elected in 2016.

[2] When studying local elections during the COVID pandemic in France, Morisi et al. (2024) state that "voters might consider that incumbents will perform better simply because they have had several years of experience with the local administration and can swiftly mobilize all the available local resources".

[3] As another example, New York City mayor Michael Bloomberg in 2008 justified his extraordinary third tenure during the financial crisis with similar arguments (New York Times, 2008).

We fill this gap by examining COVID-19 vaccinations in Brazilian municipalities in 2021. This is the year vaccines became available and also the first of the 4-year tenure of mayors elected at the end of 2020. Brazilian health care provision is fairly decentralized, and mayors have extensive control over the implementation of services ranging from basic home visits to complex hospitalizations. This decentralized framework was also extended to the country's mitigation policies during the pandemic, both for the containment measures in the initial waves and the vaccination effort after 2021.

While the central government was primarily responsible for procurement and allocation of doses across municipalities, the distribution to the population was carried out by municipal administrations and their bureaucrats. Mayors generally placed a high priority on vaccination and were directly involved in critical stages of the process: they influenced the creation and enforcement of vaccine guidelines such as the time between doses and the prioritization of age groups, and more importantly, they had to mobilize, monitor, and motivate bureaucrats across all areas of their administrations to successfully execute nonroutine tasks. This involved top-down decisions such as the appointment of leadership within the bureaucracy, to the coordination of street-level bureaucrats that were responsible for all logistical aspects of these campaigns, often working as volunteers and in extra shifts. Given both the urgency and complexity of this policy effort, there was considerable heterogeneity in its efficacy across municipalities. In this context, we test whether mayors who had experience managing their cities in the first 8 months of the pandemic were better prepared to implement the vaccination effort that started in 2021.

We address this question using a regression discontinuity design (RDD) to compare municipalities where an incumbent mayor was reelected in 2020 in a close race to ones where they lost to a newcomer. By providing a quasi-random assignment of the incumbent's victory, this design addresses two pitfalls in comparing the vaccination performance of elected incumbents and newcomers. It first mitigates concerns that both vaccination levels and the incumbent's victory are the common effects of idiosyncratic location-specific characteristics in these races. Second, it separates the effects of experience from the ones of positive selection since, in the close election RDD, the incumbent's electoral victory (or defeat) is uncorrelated by assumption with their previous performance in office.

We first show that incumbents vaccinated 12% more of their voters than newcomers in similar loca-

tions by the end of 2021. This also reduced mortality in incumbent-led municipalities by 7% in 2021-2022. However, this effect cannot be entirely attributed to experience before we address other possible explanations. The first is bureaucratic turnover, which has been widely documented in Brazilian municipalities whenever there are changes in either the mayor or the party leading the local administration (Colonnelli, Prem, and Teso, 2020; Frey and Santarrosa, 2024; Goyal and Sells, 2024), with relevant downstream implications for public services (Akhtari, Moreira, and Trucco, 2022; Toral, 2024).

To assess whether the effects on vaccination are driven by newcomers reshuffling the local health care bureaucracy, we examine an alternative sample of cities where incumbent mayors did not run for reelection, but their parties did (the *Party Turnover* sample). Here, the RDD identifies the effect of an incumbent's party victory on vaccination, but with a new mayor who lacks experience, just like a newcomer. Given that bureaucratic turnover in Brazil is primarily observed in periods of party change, we use this sample to isolate bureaucratic turnover's effects on vaccination and to provide a benchmark for interpreting the findings in our main sample (the *Mayor Turnover* sample).

Not surprisingly, we find consistent evidence of bureaucratic turnover in both samples. In other words, when incumbent mayors or incumbent parties lose an election, we observe more dismissals and new hires of the health care bureaucracy. More importantly, while we do not observe any vaccination effects in the Party Turnover sample, bureaucratic turnover is extremely similar in both samples. In other words, vaccination rates are only higher for reelected incumbents in the sample where we compare mayors with different experience levels. This result further suggests that it is the differential experience of politicians, and not of bureaucrats, that drives vaccination performance in this context.

We also address the issue of reelection incentives. Mayors have a limit of two consecutive terms in office, so incumbents reelected in 2020 cannot run in 2024, whereas newcomers can. If Brazilian voters are highly resistant to the COVID-19 vaccine, the effects could be a consequence of newcomers being more accountable to the preferences of their electorate due to reelection incentives.

We assess this narrative by first showing that vaccine acceptance in Brazil is, in fact, one of the highest in the world and a matter of national pride. Nevertheless, increases in polarization since the 2018 presidential election, allied with President Bolsonaro's denialist rhetoric (Ajzenman, Cavalcanti, and Da Mata,

2023; Araújo and Kerler, 2024; Leal, 2024), led far-right voters to become more hesitant about the vaccine. Consistent with this cleavage, we also use the official campaign documents of the universe of Brazilian mayoral candidates to show that parties on the far right of the ideological spectrum are much less likely to provide policy proposals related to the pandemic than parties on the extreme left. Thus, if this narrative drives our results, we should observe higher effects in places with more Bolsonaro supporters and in municipalities governed by aligned parties. However, the data does not support this story. The effects are slightly higher in municipalities with weak support for Bolsonaro in 2018 than in his strongholds, although the difference is not statistically significant. More notably, the effects are actually much higher within the group of municipalities that elected mayors from left-leaning parties.

We also emphasize the importance of administrative experience acquired precisely during the crisis for the success of vaccination efforts. We show that the vaccination effects are coming almost entirely from the subset of municipalities with higher COVID incidence in 2020 and where the incumbent mayors faced the worst of the pandemic at that time.

While political experience is not the only driver of policy performance, these findings suggest that it plays a significant role in this crisis context. This motivates the important question of whether the policy losses resulting from the lack of experience can be compensated by other candidate traits or by characteristics of the institutional environment. Our final empirical exercise searches for potential compensation mechanisms by estimating heterogeneous treatment effects by characteristics of mayors and municipalities. We find that most of the vaccination gap between incumbents and newcomers is found in the group of mayors that are less educated, male, and have no past experience (pre-2016) in public administration during "normal times."[4] What is more, the effects are concentrated in locations with weak bureaucratic presence (pre-treatment). Although these final exercises are at best suggestive, altogether they are consistent with the narrative that infrastructure investment in public goods, combined with the election of qualified politicians, might help mitigate policy gaps coming from a lack of expertise learned on the job.

[4]The result on gender is consistent with recent work on Brazil showing that female mayors were also more responsive in the containment measures early in the pandemic (Bruce et al., 2022; Chauvin and Tricaud, 2024).

Background: COVID Vaccination in Brazil

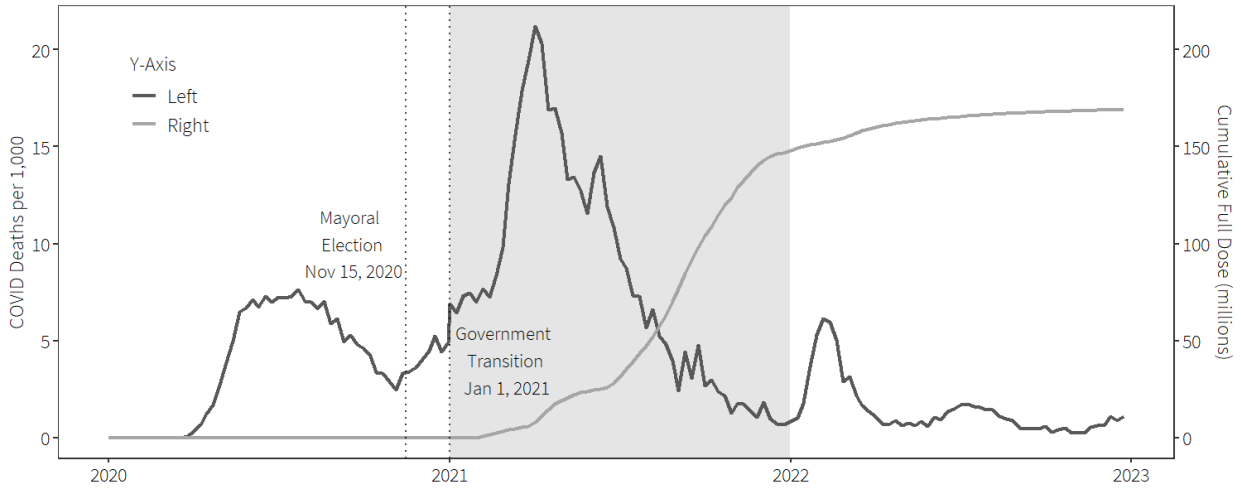
Brazil is a three-tier federative republic with autonomous federal, state, and municipal governments. The nearly 5,700 municipalities—the lowest level of autonomy—are run by democratically elected mayors. Municipal elections occur every four years in all locations on the same day. Mayors are elected in a plurality system for all municipalities except for 95 cities with more than 200,000 registered voters that have a runoff round with the top two candidates.[5] All mayors are limited to two consecutive terms in office. The 2020 mayoral race happened on Nov 15 (runoffs on Nov 29), and the elected mayors were sworn to office on Jan 1, 2021, between the first and second country-wide waves of COVID infection, and only a few weeks before vaccines became locally available (Figure 1).

Municipal administrations are responsible for implementing several essential public services in the country, including education, health care, social assistance, transportation, sanitation, and zoning. The bulk of the health care services is provided through the state-sponsored universal system (SUS), although middle- and upper-income households often rely on private health insurance. Within the public system, provision is fairly decentralized. The central government offers funding and manages regulation, while states and primarily municipalities deliver care (Federal Constitution, Art. 23 and 30, VII). Most municipalities handle services that range from basic preventive care, such as vaccinations and home visits by teams of health care workers, to high-complexity services, such as hospital care and ICU units. Especially during the pandemic, the public sector monopolized the distribution of the COVID-19 vaccine until June 2022 (Law 14,125 of 2021), and municipal health clinics administered nearly all COVID-19 vaccinations throughout 2021.

Vaccines in Brazil are a matter of national pride (Gramacho et al., 2024). The country has one of the largest public vaccination programs in the world, providing free immunizations for more than 20 diseases in all municipalities (Domingues et al., 2020). In 2019, 88% of the population believed that vaccines were important for children—one of the highest acceptance rates worldwide (Figueiredo et al., 2020).

[5] Our main sample conservatively excludes these largest municipalities to ensure we only compare cities with similar electoral calendars. Nevertheless, Table A.6 (appendix) shows that their inclusion in the analysis has no meaningful impact on the results.

Figure 1: COVID Deaths and Vaccines in Brazil



The shaded area represents the year 2021, which is the focus of this analysis. Data on COVID-19 infections and vaccines come from MS (2020) and MS (2024), respectively.

Nonetheless, the public perception of vaccination has been increasingly influenced by political polarization since the election of far-right President Jair Bolsonaro in 2018. During the pandemic, Bolsonaro adopted a denialist stance and, on multiple occasions, minimized both the death toll of the virus and the importance of the vaccine. He also challenged social distancing policies implemented by state governors and mayors and promoted ineffective treatments like hydroxychloroquine (Ajzenman, Cavalcanti, and Da Mata, 2023; Araújo and Kerler, 2024). In response, the National Congress asserted the competence of local governments to adopt health measures to fight the pandemic (Law 13,979, 2020), and the Supreme Court ruled against federal intervention in local containment policies (Decision ADPF 672, 2020). This led mayors to actively implement and enforce containment measures such as business closings and social distancing restrictions in their jurisdictions (Bruce et al., 2022; Chauvin and Tricaud, 2024; Desai, Frey, and Tyson, 2024).

The immunization effort against COVID-19 that started in 2021 followed the same decentralized structure, with municipal administrations being responsible for distributing vaccines to households. In doing so, the new mayors that started their 4-year tenure in 2021 faced similar political challenges as

those faced by the 2017-2020 administrations when trying to implement containment policies.[6] Frustrated with the federal government's slow pace in procuring vaccines, mayors in several state capitals even sought a vaccine supply deal with the Butantan Institute (Exame, 2021), and over 1700 municipalities attempted to form a consortium under their national association to procure their own vaccines (Brasil 247, 2021). However, the Ministry of Health established early that any COVID-19 vaccine acquired by local governments or private companies would be seized by the federal government and distributed according to equitable and technical criteria (O Tempo, 2021).

Accordingly, the allocation of vaccines across municipalities followed a needs-based approach. The Ministry of Health distributed doses proportionately to the priority groups' population size.[7] Given the participative logistic plan and the technical criterion for proportional vaccine quotas assignment, it's unlikely that the distribution of vaccines to different municipalities was influenced by inequity or political convenience.[8] Overall, despite Bolsonaro's anti-vaccine rhetoric and tensions among different government levels, the citizens' demand for vaccines proved to be high. At the end of 2021, Brazil reached a full-schedule vaccination rate of 80% among the eligible 177 million citizens (MS, 2021a).

However, there was still significant variation in coverage between municipalities: At the end of 2021, the standard deviation in the cross-municipal vaccine coverage was 16%, and a quarter of all locations had full-dose coverage below 67%. Within the context described above, these differences reflect the consequence of the work of municipal governments.

Mayors and the Immunization Effort. Since the supply of vaccines was beyond mayors' control, most of their influence came in two forms. First, the municipality was responsible for planning the immunization campaigns. This included setting the interval between doses, prioritizing age groups, disseminating information about campaigns, reaching remote neighborhoods with mobile vaccination units, and

[6] There is extensive anecdotal evidence that mayors were keen to start vaccination campaigns. For example, the National Mayors Front, led by Campinas' mayor Jonas Donizette, characterized the federal procrastination in sourcing vaccines as unreasonable. The president of the National Confederation of Municipalities, Glademir Aroldi, also expressed concerns about possible inequities arising from a lack of coordination among local vaccination strategies (Exame, 2020).

[7] The distribution plan was defined with the National Council of Health Secretaries (CONASS) and the National Council of Municipal Health Secretariats (Conasems)—which are institutionalized bodies with representatives of all states and municipalities—and the technical reports with quotas by municipality and state were publicly released (MS, 2021b).

[8] In appendix, Table A.9, we confirm this assessment by showing that our political effects on vaccination rates are not driven by differential allocation across municipalities.

managing vaccine storage to ensure the most efficient use of doses. Second, and likely more significant, these campaigns required massive re-allocations of human resources, both from the bureaucracy and the civil society. The urgency and sheer scale of the effort led many cities to organize task forces (*mutirões*) that typically involved extra shifts and the participation of hundreds and even thousands of bureaucrats, such as in state capital Salvador, BA (Salvador, 2021). These joint efforts also required mobilizing public servants from a variety of sectors beyond health care, such as traffic coordination and security services, as in the example of Corumbá, MT (Corumbá, 2021).

Mayors also treated vaccination as a priority,[9] and were directly involved in the campaigns' planning and implementation. In the state capital, Porto Alegre, RS, the mayor's cabinet mobilized different areas of the bureaucracy to volunteer extra hours in the immunization effort (Porto Alegre, 2021). In Jundiaí, SP, the mayor organized an event to honor hundreds of volunteers in these campaigns, including retired health care workers (Jundiaí, 2021). What is more, incumbents would sometimes re-allocate entire departments, trying to improve the administration's performance in the immunization effort, as in the case of Nova Friburgo, RJ (Nova Friburgo, 2021).

Outperforming municipalities also streamlined vaccination efforts by setting up temporary tents, allowing for pre-registration, and extending vaccination hours to weekends, as in São Paulo, SP, and Rio de Janeiro, RJ, for example (São Paulo, 2021; Rio de Janeiro, 2021). By the end of each day, some municipalities used expiring doses to proactively vaccinate passersby and avoid waste (O Globo, 2021). Vaccination could also be expedited by fully using available inventories of AZD1222 (AstraZeneca/Oxford) and Comirnaty (Pfizer), given the 90-day interval between the first and second doses. However, some mayors, wary of the risk of slow replenishment, withheld doses to guarantee second shots, a decision that could delay the first doses to the unvaccinated population. Different documentation requirements for the vaccine across the country also played a role in the campaigns' effectiveness, since excessive requirements confused citizens and caused long lines and administrative burdens, diverting health workers' time that could be proactively seeking unvaccinated citizens (BBC News Brasil, 2021).

The press has criticized other seemingly simple logistical issues. Poorly managed lines in public health

[9] For example, see the statement of the new mayor in Valinhos, SP (Valinhos, 2021).

clinics—such as those in Belford Roxo, RJ—hampered vaccination intake among elderly citizens (G1, 2021). Some municipal administrations also failed to disseminate information about vaccination dates and locations and to reach remote neighborhoods—all actions that required bureaucratic mobilization. This led to unused excess doses being returned to the state pool of vaccines to be redirected to other municipalities. This happened even in locations without full coverage, such was the case of some cities in the state of Piauí (PI) (G1, 2021a). This problem was also often more burdensome for more vulnerable populations, such as older adults, as in the case of Sertanópolis, PR (G1, 2021b). Finally, although some press interviews with state authorities anecdotally indicate that vaccine waste was low in general (O Globo, 2021), this was another potential source of failure in the immunization campaigns.

Theory: Political Experience and COVID Vaccinations

Broadly, this paper investigates whether administrative experience affects policy provision. More specifically, it answers a straightforward question: Did the administrative experience during the first 8 months of the pandemic make incumbent mayors better at vaccinating their constituencies in 2021?

There is a vast literature on what determines the effectiveness of politicians in delivering policies in developing contexts (Grossman and Slough, 2022). Much of this work focuses on the incentives that lead incumbents to put effort into public good provision. Within this context, the literature particularly emphasizes accountability mechanisms and how elections allow voters to monitor and reward (or punish) politicians for their performance in office (Ashworth, 2012; Duggan and Martinelli, 2017). Nevertheless, since accountability systems often fail in developing nations, public good provision is also heavily influenced by the incentives arising from practices generally seen as detrimental to welfare, such as clientelism or corruption, which have been widely documented in Brazil (Ferraz and Finan, 2011; Frey, 2019; Hidalgo and Nichter, 2015; Nichter, 2018).

Recent work has also focused on the incentives coming from the descriptive traits of politicians and how they shape substantive representation in policy outcomes. Particularly in the Brazilian context, policies are influenced by politicians' characteristics, such as gender (Bruce et al., 2022; Chauvin and Tricaud,

2024), race (Bueno and Dunning, 2017), education (Desai and Frey, 2023), or career (Novaes, 2024).

This article shifts the focus away from the study of the **politician's incentives** and emphasizes the role of **politician's ability** to implement public services. On this dimension, while some work has examined the role of incumbents' characteristics such as education (Carnes and Lupu, 2016) on policy outcomes, much more emphasis has been put on how the incumbent's ability to "get things done" is shaped by their relationship with bureaucrats (Grossman and Slough, 2022). The performance of bureaucrats often determines policy outcomes (Slough, 2021), and in doing so, it mediates the politician-voter relationship, directly influencing the electoral future of incumbents (Dasgupta and Kapur, 2020; Martin and Raffler, 2021; Slough, 2024a). Accordingly, public service implementation is typically better when incumbents effectively learn on the job (Gulzar and Pasquale, 2017; Raffler, 2022; Slough, 2024b); when their policy priorities and goals are aligned with the politician's (Toral, 2023); and when they are rewarded for their good performance (Ashraf, Bandiera, and Jack, 2014).

By answering our initial question, we connect to this literature in two ways. We first highlight the role of experience in future performance in the office, particularly of expertise acquired during a crisis. Although the performance of incumbents is likely to depend on a variety of qualities, some critical skills learned only on the job (Krause and O'Connell, 2016; Miquel and Snyder Jr, 2006), and expertise acquired outside the public administration might not always transfer to elected positions (Lewis, 2007).

Second, we answer the question in a crisis environment where the relevant dimension of on-the-job-learning is the dynamic relationship between incumbents and the bureaucracy. The Brazilian context described above provides several examples of municipalities where the success of vaccination efforts resulted from the mayor's ability to mobilize, monitor, and effectively motivate personnel to ensure that vaccines were distributed broadly and quickly. This required high-level decisions such as the appointment of bureaucrats to leadership positions and the creation of immunization plans, as well as the coordination of the logistical effort of street-level bureaucrats in the delivery of vaccines.

We also argue that, due to both the urgency and the scale of the policy intervention here, the type of learned experiences that might boost the performance of politicians is likely to be unique. If expertise is acquired through repetition (Krause and O'Connell, 2016; Miquel and Snyder Jr, 2006), then mayors in

this position between March and December of 2020 should be uniquely prepared for the 2021 vaccination effort. During the first 8 months of this public health crisis, they faced similar challenges in managing resources during the initial waves of infections, particularly in allocating limited physical resources within their jurisdictions, such as ICU beds or ventilators; and working to retain, motivate, and mobilize health care workers to safely perform non-routine tasks under intense pressure.[10]

In the next section, we present both our data and empirical design and describe how we use them to isolate the impact of crisis experience on vaccine coverage from other alternative factors such as reelection incentives and bureaucratic expertise. We then present and discuss our findings in the following section.

We also highlight that the purpose here is not to show that experienced politicians always perform better. Expertise acquired through learning-by-doing in the public sector has been shown to have negative implications for welfare in certain cases (Coviello and Gagliarducci, 2017), and its net impact is likely to depend on the institutional context under study. Similarly, we do not argue that experience is the most critical determinant of public good outcomes. While our results suggest that, in this context of crisis, the experience of political incumbents plays a more prominent role than their reelection incentives or bureaucratic expertise, future research is needed to examine the scope conditions that would generalize our findings.

Finally, the theoretical expectation delineated here assumes that vaccines are a public good desirable to voters and, therefore, that elected politicians have a mandate to deliver them. That being said, we acknowledge that the issue of immunization has become more polarized during the pandemic, both in Brazil and abroad. As we present our empirical strategy and results, we also address the plausibility of our assumption in the context under study.

Data and Empirical Design

This article uses vaccination data from Brazilian municipalities to examine the effect of political experience on the quality of public good implementation in the context of crisis response. The empirical

[10] This was due not only to COVID infections, but also the backlog of other health conditions that went untreated during that period.

strategy benefits from the timing of the local electoral cycle, given that the country-wide mayoral elections happened on November 15, 2020,[11] precisely between the first and second waves of COVID-19 infection (Figure 1). All mayors elected in November took office on January 1, 2021, only 17 days before the country's first dose of the COVID-19 vaccine was applied.

This context creates the opportunity for a comparison in vaccination rates between municipalities where an incumbent mayor was reelected in 2020 and those that elected a challenger. While the latter group had a newcomer in charge of the vaccination efforts, the former had a mayor with recent experience in office, and what is particularly important, experience obtained during a period of 8 months of intense COVID-19 infections when mayors had control over several mitigation policies.

Nevertheless, there are a few reasons why this comparison might not at first isolate the impact of experience on vaccinations, a problem that we address with the research design described in the sequence. First, municipalities that reelected an incumbent might fundamentally differ from those that elected a challenger. In other words, local characteristics might affect both the reelection rate and the quality of local public services. Second, reelected incumbents are different from challengers not only on their recent office experience but also on their "proven ability", i.e., the fact that they have won an election after revealing their performance in office (De Janvry, Finan, and Sadoulet, 2012; Frey, 2021).

We start by addressing these two challenges using a regression discontinuity design (RDD), where we compare municipalities where an incumbent mayor was reelected in 2020 in a close race to ones where the incumbent lost. Under the usual assumptions (Lee and Lemieux, 2010), the RDD mitigates concerns regarding the influence of municipal characteristics that might confound the results and potential bias coming from proven ability. Since the incumbent's victory (or defeat) in this design comes from the quasi-random assignment of the election winner, it cannot be attributed to the incumbent's recent performance in office.[12] Accordingly, we estimate the following equation:

$$Vacc_i = \beta_0 + \beta_1 Inc_i + \beta_2 D_i + \beta_3 Inc_i D_i + \epsilon_i \tag{1}$$

[11] All 5,569 Brazilian municipalities have mayoral elections on the same day, every four years. The 95 largest cities in the country have a runoff system with a second election between the first two candidates, which happened on November 29.

[12] The RD effect is only identified for a sample of municipalities where the incumbent mayor actually ran for reelection and finished in the top 2. Please see the article's conclusion for a discussion on the external validity of these findings.

where for municipality i, the binary variable Inc_i indicates whether the incumbent won the last election, and D_i is the difference between the election winner and the runner-up in vote percentage. The treatment effect on the vaccination rate $Vacc_i$ is given by β_1. As usual, regressions are weighted by the triangular kernel, and the sample is restricted to values of D_i that fall within an optimal bandwidth (Calonico et al., 2019). In the appendix, we show that both the density of the observations (Figure A.1) and several municipal covariates measured pre-treatment (Table A.1 and Table A.2) are continuous at the cutoff. All election data was obtained from the Brazilian Electoral Court (TSE, 2016-2020).

The main outcome variable is the vaccination rate in 2021 in each Brazilian municipality. This data was obtained from the Health Ministry (MS, 2024), and the main variable is defined as the percentage of the local population that has received the vaccine during that period.[13] We focus on full dose of vaccination in 2021, but also show the results for the first dose, and for later periods.[14]

Accordingly, β_1 above identifies the treatment effect of having a reelected incumbent as mayor vs. a newcomer. As in all close election designs that use politician characteristics to assign treatment status, the estimates should be interpreted as the compound effect of incumbency status plus other individual characteristics that might differentiate incumbents and newcomers at the discontinuity (i.e., when the margin of victory equals zero). Among them, this article aims to emphasize the role of recent experience on the job, which is higher for reelected incumbents, by construction. Thus, we show in the appendix (Table A.1 and Table A.2) that incumbents and newcomers do not differ, at the discontinuity, in several other individual characteristics that could potentially impact vaccination outcomes such as race, gender, education, professional background, and party ideology.

We also address a related concern in the close election RD with the role of unobserved competence[15]

[13] As a proxy for the potential target population for the vaccine in 2021 we use the number of voters in the Nov 2020 municipal election. This is a good proxy for two reasons: (i) it provides a more updated picture of the local population than the most recent census data from 2010; and (ii) it closely reflects the target public for the vaccine given that voting age in Brazil starts at 16, and voting is mandatory for the population between 18 and 70. Vaccines were not approved for teenagers 12-15 until June 2021 and for children 5-11 until mid-December 2021. Nevertheless, we show in Table A.4 that our results are robust to using population data based on the 2010 Census. All census data was obtained from IBGE (2010).

[14] The raw vaccination data has observations at the individual-shot level, with additional information on the date and brand of the vaccine takes. We aggregate first, second, and single doses by vaccination site and time period (year or quarter, in different specifications). At the time, the Janssen vaccine was the only single-dose vaccine. Following official statistics guidelines (MS, 2024), we exclude any vaccination record dated before January 17, 2021, the day Brazil administered its first official COVID-19 vaccine shot. This date discrepancy affects fewer than 0.4% of all recorded doses, presumably due to data-entry errors.

[15] Competence that is not captured by measured traits such as education and professional background.

on the effects (Marshall, 2024). It is reasonable to expect that the politician's unmeasured competence should positively impact vaccinations while being associated with higher vote shares (i.e., everything else fixed, voters prefer competent candidates). The related concern raised by Marshall (2024) would be relevant in the context of this study if personal incumbency were negatively associated with vote shares, either because voters are more likely to vote for change or because corruption is more salient for incumbents, for example. If this were the case, unobserved competence might be the compensating differential required for incumbents to be competitive against newcomers who do not pay this electoral penalty. In other words, only more competent incumbents will ever make it to close races, which would confound the interpretation of the results.

However, this is not the electoral pattern in Brazil, where incumbent mayors have a vote share advantage in their reelection attempts.[16] Figure A.2 (appendix) shows that in 2020, nearly two-thirds of the incumbents who ran in contested races won the reelection (this was higher at 80%+ in 2024).[17] Also, incumbents had an average margin of victory of 7.4%, meaning that only the electorally weak incumbents faced close races. This suggests that any compensating differential coming from unobserved competence here implies that incumbents who win close races might be LESS competent than newcomers and that our results should be interpreted as a lower bound for the treatment effects (Marshall, 2024).

Disentangling the Role of Experience from Reelection Incentives and Bureaucratic Turnover

The literature emphasizes two additional reasons why this RDD effect might not single out experience as the channel that connects the reelection of an incumbent to the vaccination outcomes. First, Brazil has a limit of two consecutive terms for mayors. This means that reelected incumbents in 2020 could not run again in 2024, when newcomers could. These reelection incentives have been shown to influence other dimensions of public policy implementation, such as cash transfer distribution (Bueno, 2023; Frey, 2021) or corruption (Ferraz and Finan, 2011), and could be behind the differences in immunization rates. The particular concern here is that higher vaccination coverage under reelected incumbents could be driven by

[16] We emphasize that the incumbency disadvantage documented by Klašnja and Titiunik (2017) in Brazilian mayoral election is at the PARTY level, and driven by lame duck mayors that cannot run for reelection themselves, instead of the reelection-eligible incumbents that we study here (i.e. we focus on personal not party incumbency).

[17] 100 incumbents ran uncontested in 2020, 3% of total races.

newcomers being more responsive to voters in contexts where the electorate wishes to avoid the vaccine.

We first assess this alternative narrative with evidence of vaccine desirability in Brazil and check whether vaccine resistance might have played a role in 2021. Second, we leverage the fact that the national political environment during the pandemic was highly polarized around the issue, with Right-wing President Jair Bolsonaro championing anti-vaccination arguments on one side and the Left-wing opposition led by the Workers' Party (PT) on the other. Thus, we use the proximity to Bolsonaro as a proxy of the anti-vaccination stance for both the average electorate and the elected mayor in each municipality. With this data, we then further evaluate this narrative by examining the heterogeneity patterns in the RD effects for locations with high and low vaccine resistance.

Our second concern is that lower vaccination rates under a newcomer could be a consequence of higher turnover in the bureaucracy, which is expected with changes in the administration. Recent literature emphasizes that changes in either the mayor or the party in charge of Brazilian municipalities often come with significant bureaucratic turnover (Colonnelli, Prem, and Teso, 2020; Frey and Santarrosa, 2024; Goyal and Sells, 2024), which has further consequences for the quality of public services (Akhtari, Moreira, and Trucco, 2022; Toral, 2024).

We address this concern by focusing on an alternative sample of municipalities where, in 2020, incumbent mayors did not run for reelection, but their parties did with a new candidate (we call this the *Party Turnover* sample).[18] With the same RD design, within this sample, we compare places where the incumbent party won in a close race to municipalities where it lost and identify the effect of electing a new **party** to office. Here, both treatment and control groups have new mayors and, therefore, have a comparable lack of recent office experience and reelection incentives.[19] Thus, it is likely that whatever vaccination effects are observed in this sample are due to turnover in the bureaucracy, which we measure with individual data on the universe of health-related workers in Brazil provided by the National Registry of Health Establishments (CNES, 2020-2021). This will inform us about the impact of this specific dimension on the COVID-19 vaccination effort in Brazil and allow us to separate it from the effects of

[18] In most of these municipalities (69%), incumbent mayors could not run because they were term-limited, not because they decided not to do so.

[19] Table A.1 (appendix) also shows that several covariates that measure pre-treatment characteristics of municipalities, candidates, and parties are continuous at the cutoff for this sample.

experience in our main sample (the *Mayor Turnover* sample).

We acknowledge that this exercise's validity depends on how similar the Mayor Turnover and Party Turnover samples are. Table 1 shows the similarity between samples in several characteristics of their municipalities, including the bureaucracy profile and their elected mayors.

Table 1: Profiles of the Party and Mayor Turnover Samples

	ALL MUNICIPALITIES		CLOSE ELECTIONS	
SAMPLE:	Party Turnover *Mean*	Mayor Turnover *Difference*	Party Turnover *Mean*	Mayor Turnover *Difference*
Number of Voters (per '000)	11.812	2.000*	12.977	-0.083
Municipal GDP	35.400	1.277	33.288	0.188
COVID cases	33.301	3.598*	34.298	0.920
Health Bureaucracy	14.978	1.298*	15.099	0.969
Campaign Expenditure Cap	0.185	0.035*	0.187	0.009
Population Density	0.034	0.009*	0.034	0.002
Municipal Deaths in 2020	2.369	0.016	2.337	0.023
2018 Bolsonaro votes	0.438	0.016+	0.434	0.010
Mayor | Race	0.671	-0.011	0.634	0.030
Mayor | College	0.564	-0.028	0.525	-0.001
Mayor | Left-Wing	0.186	-0.011	0.177	0.000
Mayor | Health Care	0.057	0.007	0.053	0.004
Mayor | Female	0.133	-0.019	0.125	0.025
Share of Health Bureaucracy in:				
Primary Care	0.619	0.004	0.605	0.016
Doctors	0.075	0.004+	0.071	0.004
Nurses	0.244	0.007*	0.238	0.012
Health Agents	0.299	-0.006	0.296	0.001
Other in Health	0.354	-0.003	0.365	-0.013
Managers	0.027	-0.001	0.029	-0.003
Municipalities	690	2988	177	627

+p<0.1, *p<0.05. The columns labeled *Mean* show the average value of each variable for the Party Turnover sample. The columns labeled *Difference* show the average difference between the samples. The detailed description of each variable can be found in Table A.1 (appendix).

For the entire sample, the Mayor Turnover municipalities tend to be slightly larger and also to have a larger bureaucratic apparatus. However, in locations where the 2020 election was close, which is the group used in our estimation, we find no statistically significant difference between the samples.

Results and Discussion

Table 2 shows the estimated effect of reelecting the incumbent on the 2021 vaccination rates (β_1). The first two columns have the effect of reelecting an incumbent mayor (from the *Mayor Turnover* sample), and the last two columns have the effect of reelecting the incumbent party only (*Party Turnover* sample). Figure 2 has the graphical representation of these results, and the appendix shows their robustness to variation in bandwidths (Figure A.3); the inclusion of covariates and variation in the polynomial (Table A.3); and different choices of construction of the outcome variable (Table A.4).

Table 2: Effect of an Incumbent's Victory on COVID-19 Vaccinations in 2021

Sample:	MAYOR TURNOVER		PARTY TURNOVER ONLY	
	Full Dose	1st Dose	Full Dose	1st Dose
Effect	12.721*	12.538*	-0.009	0.824
	(5.590)	(5.531)	(6.320)	(7.561)
C.I. (95%)	[2.46,24.38]	[2.29,23.98]	[-11.85,12.92]	[-13.31,16.33]
Baseline	101.220	116.774	103.628	117.208
Bandwidth	2.74	2.87	5.97	4.79
Municipalities	362	380	197	168

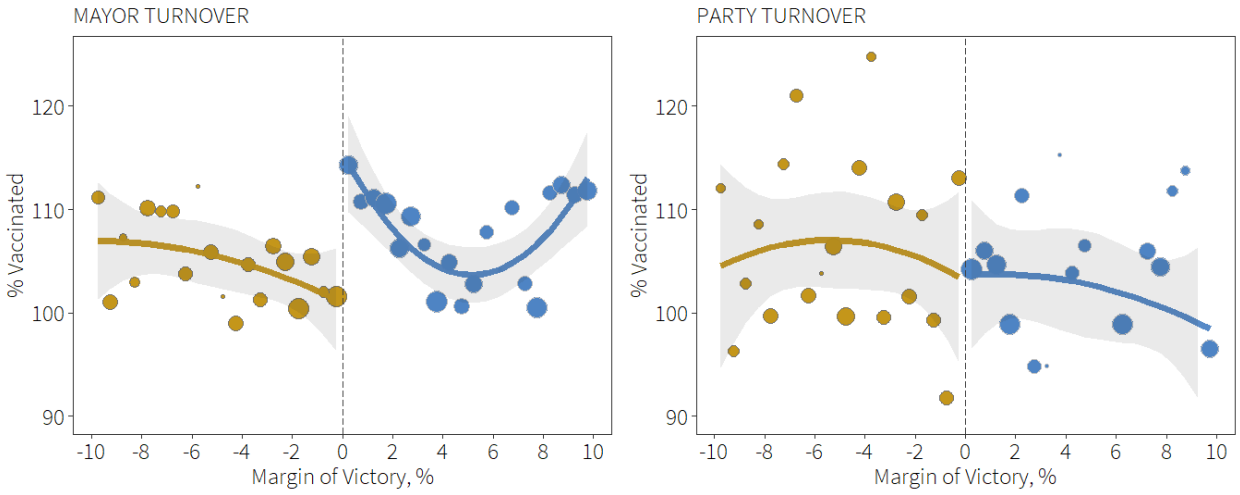
+p<0.1, *p<0.05. The effect corresponds to β_1 in equation 1. Standard errors and 95% confidence intervals are bias-robust. All variables are explained in the text. The Baseline is the average outcome for the municipalities that reelected newcomers (control group) at the cutoff. Vaccination rates can surpass 100% because the denominator is the number of voters. In page 13, we explain the construction of this outcome variable, and Table A.4 provides a robustness check to different choices for the denominator.

Overall, on average, incumbent mayors achieved vaccination rates 12.7 percentage points (p.p.) higher than newcomers in 2021—a 12% treatment effect in terms of full dose coverage. These results are simi-

lar for the first dose. However, these findings are exclusive to the Mayor Turnover sample. In the Party Turnover sample (i.e., places where the incumbent party won the reelection with a new mayor, the incumbent party's victory had no impact on subsequent vaccination rates. Such a finding is consistent with the fact that both candidates in this sample, the incumbent and the challenger, lacked recent experience on the job. Furthermore, Figure 2 emphasizes that mean baseline vaccination rates are very similar across municipalities where a new mayor took office, whether from the incumbent party or not. All the variation comes from the municipalities where the MORE experienced candidate won the election.

In the appendix (Table A.1), we use the same RD design to show that, not surprisingly, municipalities with a reelected incumbent also had lower increases in their mortality when compared to the ones where a newcomer was elected. While for the control group, the total number of 2021-2022 deaths increased 28% vs. 2019, cities with a reelected incumbent saw a lower increase of 18% in the same period.

Figure 2: Effect of an Incumbent's Victory on COVID Vaccination (Full Dose in 2021)

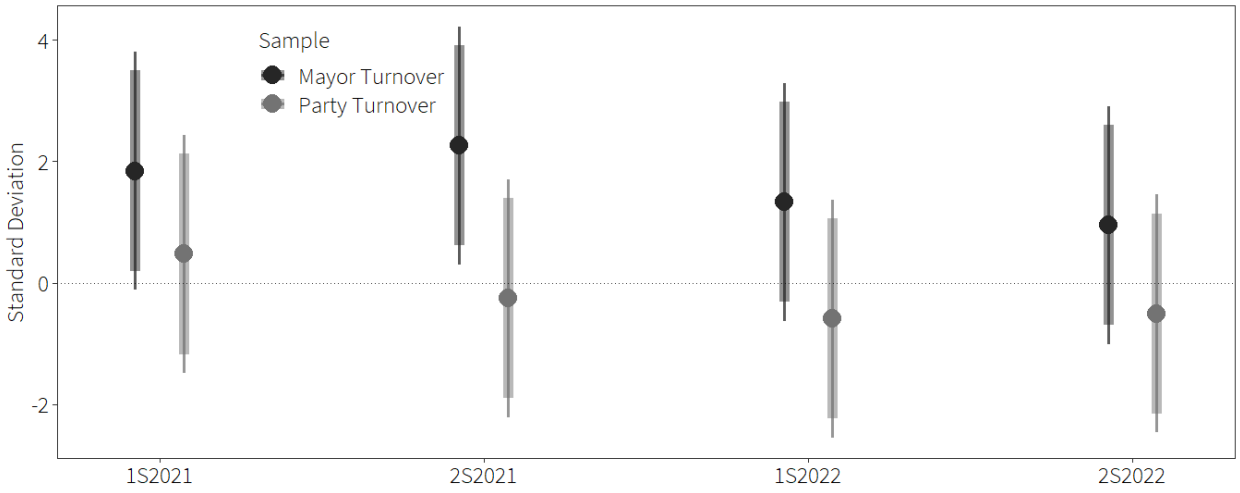


The right side of each plot shows the vaccination rates for the victory of an incumbent (mayor or party). The left side of each plot shows the vaccination rates in places where the incumbent mayor or party lost. The lines correspond to a quadratic fit. The plot bandwidth is 10%.

Figure 3 shows that this effect is highly concentrated in 2021, which is the period of the most significant ramp-up in the vaccination effort (Figure 1). While in 2022, reelected incumbents continue to outperform their newcomer counterparts, the effects become gradually weaker and lose statistical power.

Finally, Table A.9 (appendix) shows that the effects are not explained by the federal government's differential allocation of vaccines across municipalities. Using data on the spatial allocation of doses between Jan 2021 and Jul 2023,[20] we show that locations governed by reelected incumbents did not receive larger vaccine deliveries compared to the ones governed by newcomers. On the contrary, the estimated effect on allocation is negative, despite being weak and statistically insignificant. More importantly, this allows us to estimate the effect of an incumbent's victory on the total number of shots administered per dose received in each city for the same period. As expected, the estimated effects on this efficiency measure are positive and statistically significant, in line with our main results. This further supports our claim that the vaccine gap comes from differential performance at the final implementation stage, precisely where mayors have the most influence.

Figure 3: The Effect by Semester for the Full Dose



The coefficients correspond to β_1 in equation 1. The thin (wide) bars correspond to the 95% (90%) confidence intervals.

Politician's Experience or Bureaucratic Turnover?

In page 15, we discuss how the literature has documented that changes in either the mayor or the party in power in Brazilian municipalities have downstream consequences for both public employment and the

[20] Unfortunately, MS (2023) only provides the aggregated data on vaccine allocation for the entire period. Thus, we cannot use these data to build separate outcome variables for 2021 or 2022.

quality of policy implementation. In this section, we evaluate the relevance of this potential mechanism to our vaccination results.

First, we emphasize that Table 2 already showed the absence of any vaccination effects in the Party Turnover sample. Now, we estimate the effects of the incumbent's victory on several measures of bureaucratic turnover for both samples. We do this to check whether differential levels of bureaucratic change explain the difference in vaccination effects between samples.

We measure changes in bureaucracy using data on the universe of health care workers in Brazil (CNES, 2020-2021), described below in Table 3. The Table shows the share of workers in each functional and administrative category in Oct 2020, the month that preceded the municipal election.

Table 3: Profile of the Brazilian Health Care Workforce in Oct 2020

Administration:	PUBLIC SECTOR		PRIVATE SECTOR
	Municipal	State	Other
Primary Care	62.02	58.55	28.30
Doctors	8.04	13.42	21.19
Nurses	25.03	40.06	6.91
Health Agents	28.94	5.07	0.20
Managers	2.62	2.81	5.93
Other	35.36	38.64	65.76
Total Workers (million)	2.10	0.68	0.70
Municipalities	5558	2828	3740

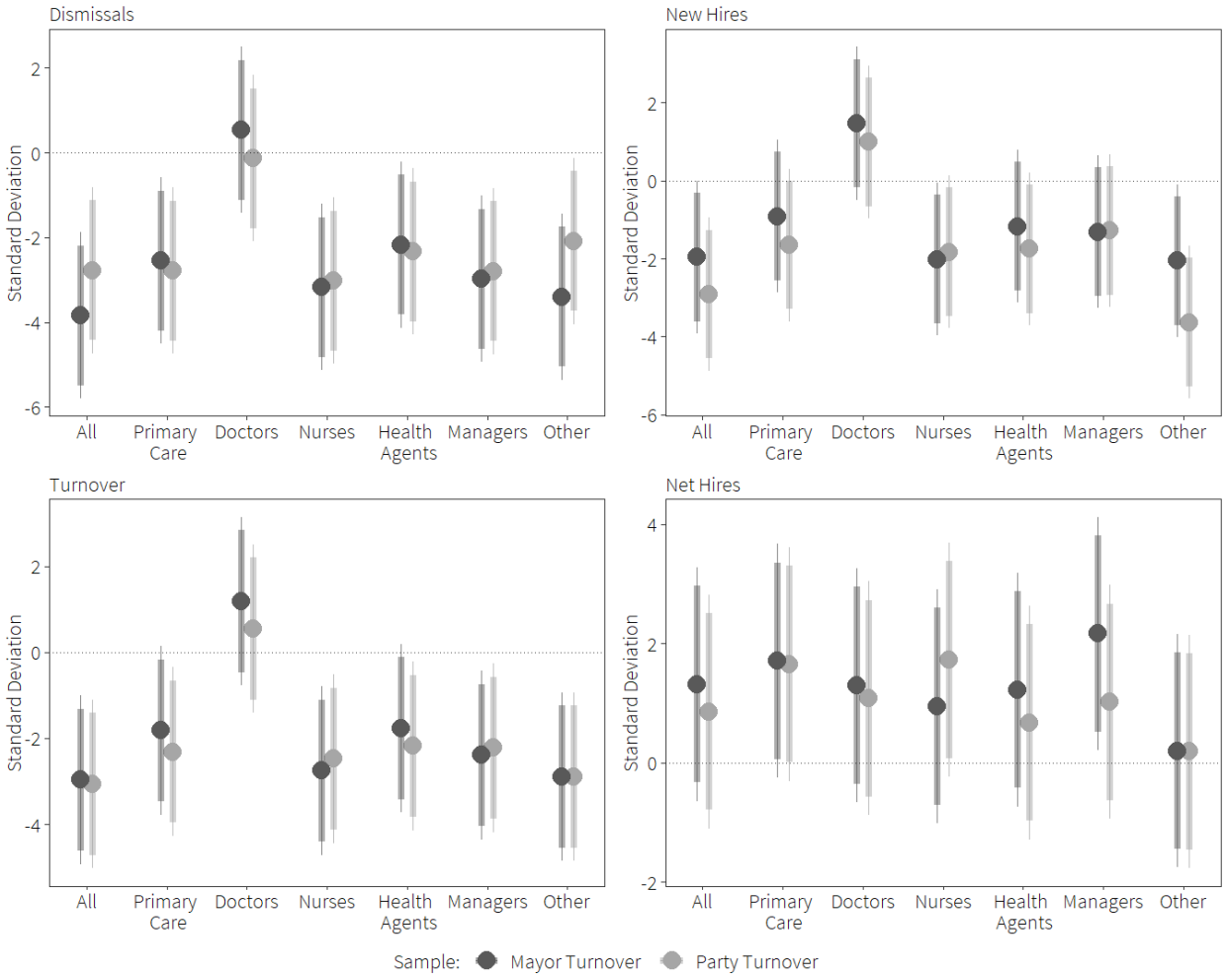
The values for each functional category correspond to the average % share of workers in that group across all municipalities with at least one worker under that type of administration. The number of municipalities with workers in each administrative category is shown in the row *Municipalities*.

Out of a total of 3.5 million workers, nearly 80% work under the public universal health system (SUS), and 60% of all do so as employees of municipal governments. Of the group of municipal employees, 62% are directly engaged in primary medical care as doctors, nurses, or health agents.[21]

[21] Health agents are often responsible for the first contact between households and the public health system, particularly in poor areas where they are tasked with jobs such as home visits or information campaigns. The position is typically occupied by workers with only a secondary education and without any formal training in health care practice.

Using the same RD design, we then estimate the effect of reelecting the incumbent on dismissals[22] and hires of municipal health care bureaucrats between Oct 2020 and Dec 2021. We also do so for a measure of total turnover (hires plus dismissals) and the net hires in the period (hires minus dismissals). Figure 4 shows the effects for both the Mayor and Party turnover samples for several job categories.

Figure 4: Changes in the Bureaucracy Between Oct 2020 and Dec 2021



The coefficients correspond to β_1 in equation 1 for each sample and outcome. The thin (wide) bars correspond to the 95% (90%) confidence intervals.

Finally, these patterns also help us rule out a slightly different explanation for the findings, namely,

[22] We classify resignations as dismissals because employees who anticipate being fired during mayoral transitions often choose to resign. In the case of public-sector health workers in Brazil, the effects of changes in mayoral administrations on resignations and dismissals tend to be similar (Toral, 2024).

that the better vaccination results under reelected incumbents resulted from the expertise accumulated by the bureaucracy during the early months of the COVID-19 pandemic in 2020, rather than from the incumbent's own learning during that period. If this were the case, we would expect to observe a vaccination gap in the Party Turnover sample, where continuity in the health care bureaucracy was very similar to that in the Mayor Turnover sample.

Experience or Reelection Incentives?

We have shown in Table 2 that vaccination rates are significantly higher under reelected incumbents, who have recent experience in office during a period of crisis. However, as discussed in page 14, newcomers are the only ones who have reelection incentives at the end of their tenure in 2024. This means that, if voters in Brazil are resistant to the COVID-19 vaccine, the effects could be just a consequence of new mayors being more responsive to the electorate and applying less effort in vaccination campaigns.

We attempt to rule out this explanation with three pieces of evidence. First, Brazil has been since the 1970s a successful history in vaccination (Gramacho et al., 2024). The country has one of the highest vaccine acceptance rates in the world, as shown by a survey of 23,000 individuals in 23 countries (Lazarus et al., 2022). They show that during the COVID crisis (June 2021), vaccine acceptance in the country was at 90%, only lower than that in China. This is in line with the survey data from Datafolha (2021) conducted in March 2021, showing that 89% of respondents intended to be vaccinated for COVID-19.

Nevertheless, the recent political polarization in Brazil was associated with vaccine hesitancy in a way that past immunization campaigns were not. President Jair Bolsonaro (2019-2022) actively advanced a denialist discourse that influenced his supporters' intention not only to avoid the vaccine (Gramacho et al., 2024), but also to comply with containment measures (Ajzenman, Cavalcanti, and Da Mata, 2023; Araújo and Kerler, 2024). Accordingly, Datafolha (2021) also shows that vaccine acceptance was actually lower at 82% among those that "trust in the words of the President." In this context, if the effects we estimated in Table 2 are at least partially driven by a wave of resistance to the vaccine, they should be **stronger** in cities with more Bolsonaro supporters, where new mayors would put less effort into vaccination.

We test this hypothesis by splitting the Mayor Turnover sample by the median value of Bolsonaro's

vote share in 2018 (second round) and by estimating the incumbent's victory effect for each group. Overall, this narrative is not supported by the data. Table 4 (first column) shows little difference in the effects estimated for locations where Bolsonaro had an average vote share of 65% in 2018 (group A), and for municipalities where he had less support (i.e. his average vote share in 2018 was only 25% in group B).

Table 4: Effect Heterogeneity by Voter Profile, Mayor's Party, and COVID Incidence

	HETEROGENEITY		
	I	**II**	**III**
Group A:	Strong Bolsonaro support in 2018	Mayor in Right-wing Party	Low COVID Incidence in 2020
Effect	10.398	0.730	3.238
	(6.770)	(6.865)	(6.004)
Municipalities	187	214	186
Group B:	Weak Bolsonaro support in 2018	Mayor in Left-wing Party	High COVID Incidence in 2020
Effect	11.954+	25.647*	24.225*
	(7.166)	(7.720)	(8.829)
Municipalities	176	157	177
Difference (B - A)	1.556	24.917*	20.987+
	(9.859)	(10.331)	(10.677)
Optimal Band.	*2.77*	*3.19*	*2.77*

+p<0.1, *p<0.05. The coefficients show the effect of an incumbent's victory for each subsample of the *Mayor Turnover* sample. All variables are explained in the text. Coefficients in each column are estimated by a single regression where we interact the binary variable in the column title with T_i, D_i, and $T_i \times D_i$ in equation 1.

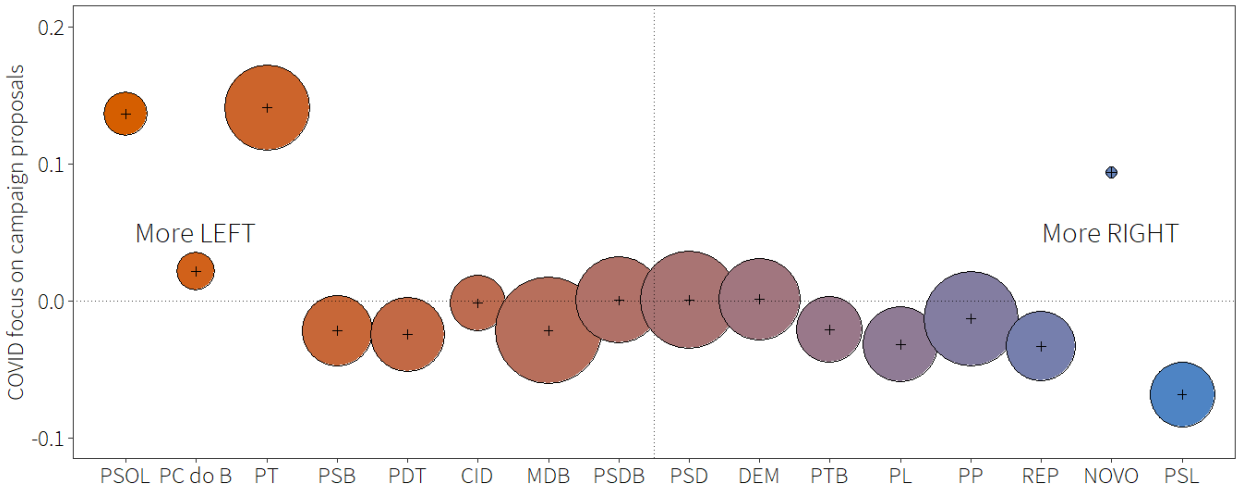
While this exercise examines the role of the electorate's willingness to be vaccinated, we now approach the question from the perspective of the mayors' partisan alignment with Bolsonaro. Here, we focus on a subsample of the 16 parties for which Zucco and Power (2023) provide updated ideological scores,[23]

[23] Zucco and Power (2023) estimate mean party ideology based on surveys in which each legislator places their own party, as well as others, on a one-dimensional ideological scale. The authors exclude small parties from the questionnaire.

which are highly correlated with each party's support for Bolsonaro's congressional base in 2019.[24] Mayors elected to office by these parties in 2020 represent 91% of our Mayor Turnover sample.

Here, we first use the official documents containing the 2020 campaign proposals of mayoral candidates from these parties to show that the amount of content related to the COVID-19 pandemic in these proposals is correlated with the Left-Right scale above. All candidates for executive offices in Brazil are required by the federal electoral court (TSE) to release their campaign platforms and priorities around a month before the election. For mayors, these documents typically have extended discussions on the candidates' proposals for different areas of the local administration. Figure 5 uses 12,168 unique candidate proposals across 5,333 Brazilian municipalities. On the x-axis, we order the parties from left to right on an ideological scale. In the y-axis, we show the share of proposals from each party that mentions the pandemic,[25] as a deviation from the sample average of 22%.

Figure 5: Share of Campaign Proposals that Mention COVID



Parties are ordered from Left to Right on the ideological scale found in Zucco and Power (2023). The y-axis shows the % share of campaign proposals that mention COVID, for each party, as a deviation from the sample average of 22%. The size of the dots reflects the number of proposals by each party across the country.

It is clear that left-wing parties are more focused on the pandemic for the mayoral tenure starting in

[24] See https://bit.ly/3zJND6g.

[25] We consider any document that mentioned the words COVID (or Coronavirus) or pandemic.

2021. Also, the difference is driven by parties in the ideological extremes, which also tend to vote in closer alignment with either Bolsonaro or the Workers' Party (PT) in Congress. For example, while 36% of PT's documents mention COVID, only 16% of the proposals by PSL—the party that elected Bolsonaro—do so, the lowest share among all parties.

Within this context, we again examine the effect heterogeneity for subsamples based on the candidates' party ideology. If reelection incentives play a role in the results, we should expect the effects from Table 2 to be weaker within the group of Left-wing mayors, given that newcomers would be more willing to invest effort in vaccination campaigns, and therefore close the gap from municipalities governed by incumbents that are experienced, but don't have the same reelection incentives.

However, the second column of Table 4 shows the opposite. The first row shows that the effects are, in fact, weaker for mayors elected by the eight most Rightist parties from Figure 5. Both empirical exercises above suggest that reelection incentives might have played a limited role, at least compared with experience, in the vaccination campaigns in Brazil.

Incumbent's Experience and Crisis Intensity

This article emphasizes the role of political experience in the delivery of public services, particularly of experience acquired during crisis times. Accordingly, the results in the third column of Table 4 provide additional evidence for this mechanism. They show how the effect on vaccination varies by the intensity of the disease spread in 2020, before the elected mayors took power for the 2021-2024 tenure. As shown in the first row of Table 4, in municipalities with below-median COVID-19 incidence in 2020 (averaging 15 cases per 1,000 voters), the effect of incumbent reelection on vaccination rates is small and statistically insignificant, at just 3 p.p. In these places, the incumbents reelected in 2021 had only been weakly exposed to the COVID-19 crisis during their previous mayoral tenure in 2020. However, the second row shows that for the group of cities where incumbents faced a much more severe COVID crisis in 2020 (59 cases per 1,000 voters), the vaccination gap between reelected incumbents and newcomers is higher at 24 p.p.

Can other Traits of Incumbents Compensate for Lack of Experience?

We have shown evidence that the unique experiences of incumbent politicians during a public health crisis allowed them to outperform newcomers in the implementation of a critical public policy. However, rather than interpreting these results as evidence that voters should always choose experienced politicians in times of crises, we believe that these findings motivate future research that attempts to understand how the adverse effects of lack of experience can be compensated by other traits of candidates or the institutional environment.

In an attempt to do so, we explore other traits of mayors that could moderate the effects of the experience documented in Table 2. We emphasize that these heterogeneity exercises do not have the same internal validity as the main RD results and do not allow us to establish precise causal links between effects and the moderating variables. They are only informative to the extent that their patterns are broadly consistent with the arguments previously made by the related literature. Table 5 shows the results.

In a nutshell, we split our main sample (Mayor Turnover) into two subsamples, according to the profile of the elected mayors or municipalities based on each characteristic of interest, and estimate the effects for both groups. Column (1) compares mayors with and without an post-secondary degree; column (2) shows the differential effects by the mayor's gender; column (3) compares reelected incumbents to a control group composed by newcomers that had previously been mayors in past tenures (i.e. before 2016);[26] and column (4) shows the differential effects for municipalities with the size of the health care bureaucracy below and above the median.

[26] Brazil has a two-consecutive term limit for executive positions. This means that mayors that served one or more terms before 2016 could have returned to the post in the 2020 election, as long as they were not the elected mayor in 2016.

Table 5: Effect Heterogeneity by the Profile of Mayors and Bureaucracies

	HETEROGENEITY			
	I	**II**	**III**	**IV**
Group A:	Mayors without a Bachelor's Degree	Male Mayors	Mayors without Previous Experience	WEAK Health Care Cities
Effect	19.322*	12.611*	14.712*	15.790*
	(6.191)	(5.849)	(6.613)	(6.418)
Municipalities	171	309	253	185
Group B:	Mayors with a Bachelor's Degree	Female Mayors	Mayors with Previous Experience	STRONG Health Care Cities
Effect	7.093	2.100	8.727	8.880
	(8.366)	(12.182)	(8.276)	(8.436)
Municipalities	191	53	109	177
Difference (B-A)	-12.230	-10.511	-5.985	-6.910
	(10.407)	(13.513)	(10.593)	(10.600)
Optimal Band.	*2.74*	*2.74*	*2.74*	*2.74*

+p<0.1, *p<0.05. The coefficients show the effect of an incumbent's victory for each subsample of the *Mayor Turnover* sample. All variables are explained in the text. Coefficients in each column are estimated by a single regression where we interact the binary variable in the column title with T_i, D_i, and $T_i \times D_i$ in equation 1.

Although we find sizable differences in magnitudes for the effects across groups, none of these differences are statistically significant. Nevertheless, the direction of the estimates is in line with both our argument and the previous findings from the related literature. First, the vaccination gap between incumbents and newcomers is low among more educated mayors and among female mayors. In other words, the lack of experience is much more problematic for the performance of men and uneducated politicians, as newcomers in these groups lag incumbents by 13 p.p. and 19 p.p., respectively. The gender result is in line with other studies that show how female mayors performed better in containment measures during the first few months of the pandemic in 2020 in Brazil (Bruce et al., 2022; Chauvin and Tricaud, 2024). For education, the weaker finding is also consistent with previous studies that show mixed results in the

country: while education does not affect corruption levels (Carnes and Lupu, 2016), more educated mayors seem to be better at obtaining federal resources and managing personnel spending (Desai and Frey, 2023; Rocha, Fernandez Orellano, and Bugarin, 2018).

Also, while newcomers with past (pre-2016) mayoral experience still lag reelected incumbents in vaccinations (an 8.7 p.p. effect), the gap is smaller than the one observed against newcomers that were never mayors before (a 14.7 p.p. effect). This suggests that political experience in the same post, even if it is not during a crisis, might moderate performance in more critical periods. The effects are also slightly higher in municipalities that, pre-treatment, had a smaller bureaucracy dedicated to health care services. This suggests that the effects of experience (and lack thereof) might be magnified in environments of poor infrastructure, where the demand for public services vastly exceeds the supply.

Conclusion

This article presents novel evidence that previous office experience significantly affects the performance of politicians during a public health crisis. It uses COVID-19 vaccinations in Brazil to show that the policy coverage in locations governed by reelected incumbents was 12 p.p. higher than in cities governed by inexperienced newcomers. In addition, the effects cannot be explained by differential experience of bureaucrats or reelection incentives, but are closely related to the level of unique expertise acquired by the mayor in 2020 during the early months of the pandemic.

These findings might raise the question of whether it is optimal to hold elections during crises. Rather than advancing this normative view, the article calls for further studies that closely examine compensation mechanisms for the lack of on-the-job experience. Here, we only provide suggestive evidence that factors such as the education level of politicians or the local level of public sector infrastructure might help politicians mitigate the policy gaps coming from their lack of expertise.

Also, the literature would benefit from similar exercises that closely examine the role of experience in regular (non-crisis) times, particularly in relation to other factors such as reelection incentives, which have been shown to be important drivers of policy performance. As a suggestive exercise, we replicate our results for the previous electoral cycle (2016), when there was no pandemic. The obvious limitation

here is the outcome: vaccinations in 2017, the post-election year, lacked both the urgency and the scale of the COVID-19 vaccination effort, as they were almost entirely composed of routine infant immunizations. Not surprisingly, we do not find statistically significant vaccination effects in locations governed by reelected incumbents, although the coefficient is positive with a lower magnitude (see Table A.10 in the appendix). This suggests that experience might still generate policy dividends in regular times, but its effects are likely less relevant than they are in environments of urgency.[27]

Finally, crises are often extraordinary events with unique characteristics. Thus, it is particularly hard to identify the scope conditions that would allow the results here to effectively inform the link between experience and policy quality in other crises, such as natural disasters or financial meltdowns, for example. This is the case even when an empirical design with high internal validity is used to identify the effects. More than ever, the question demands future research in other crisis environments to build a broader understanding of the relevant role of expertise in public administrations.

[27] We note that, in line with our main results, we also find much lower magnitudes for the effects in the Party Turnover sample.

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APPENDIX FOR ONLINE PUBLICATION

When Crisis Hits, Does Experience Matter?

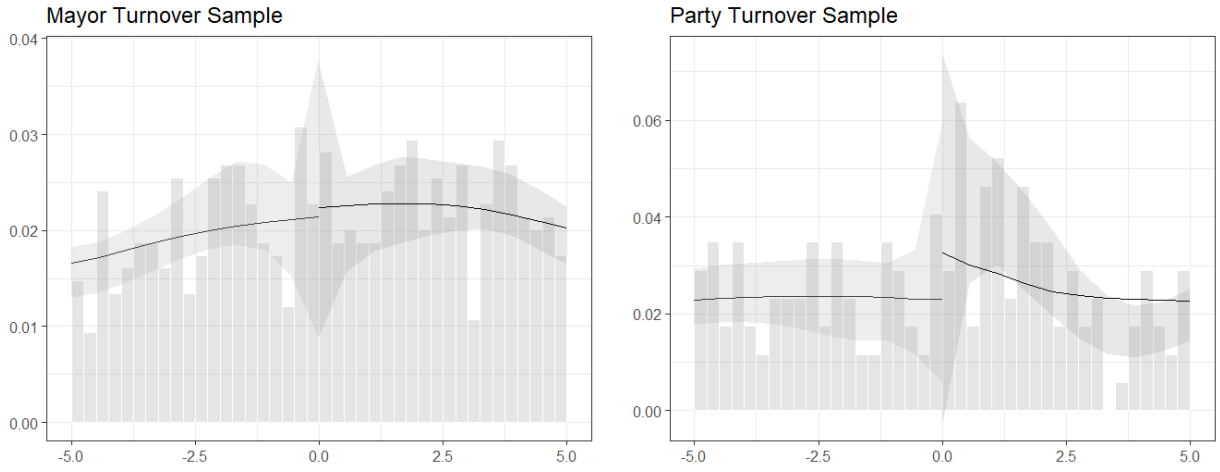
Evidence from COVID-19 vaccination

Anderson Frey[*] & Jefferson Leal[†]

[*]Department of Political Science, University of Rochester. email: anderson.frey@rochester.edu.
[†]Department of Political Science, University of Rochester. email: jleal3@ur.rochester.edu.

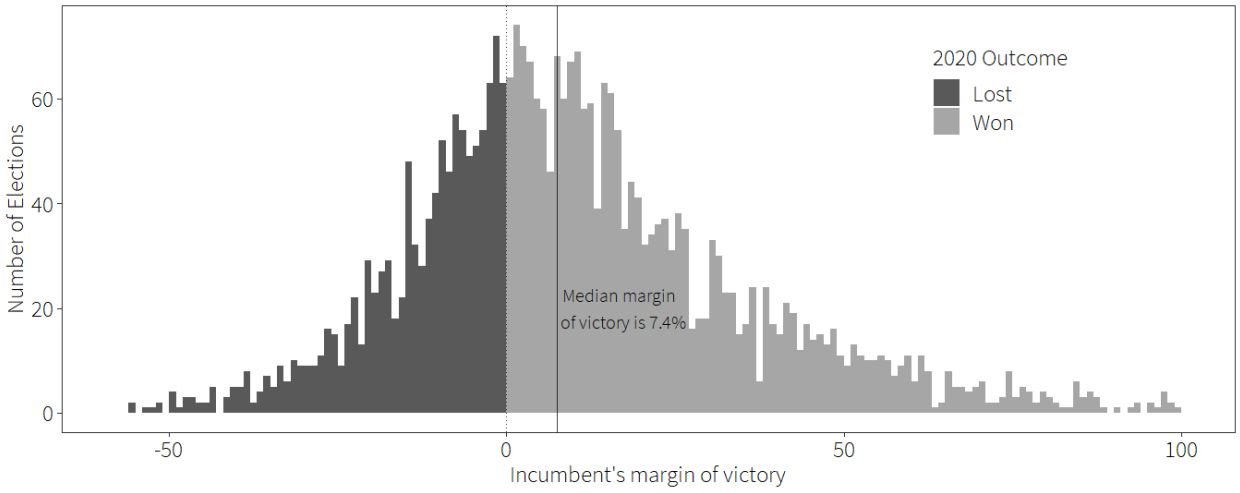
A Figures and Tables

Figure A.1: RD Density Test for both Samples



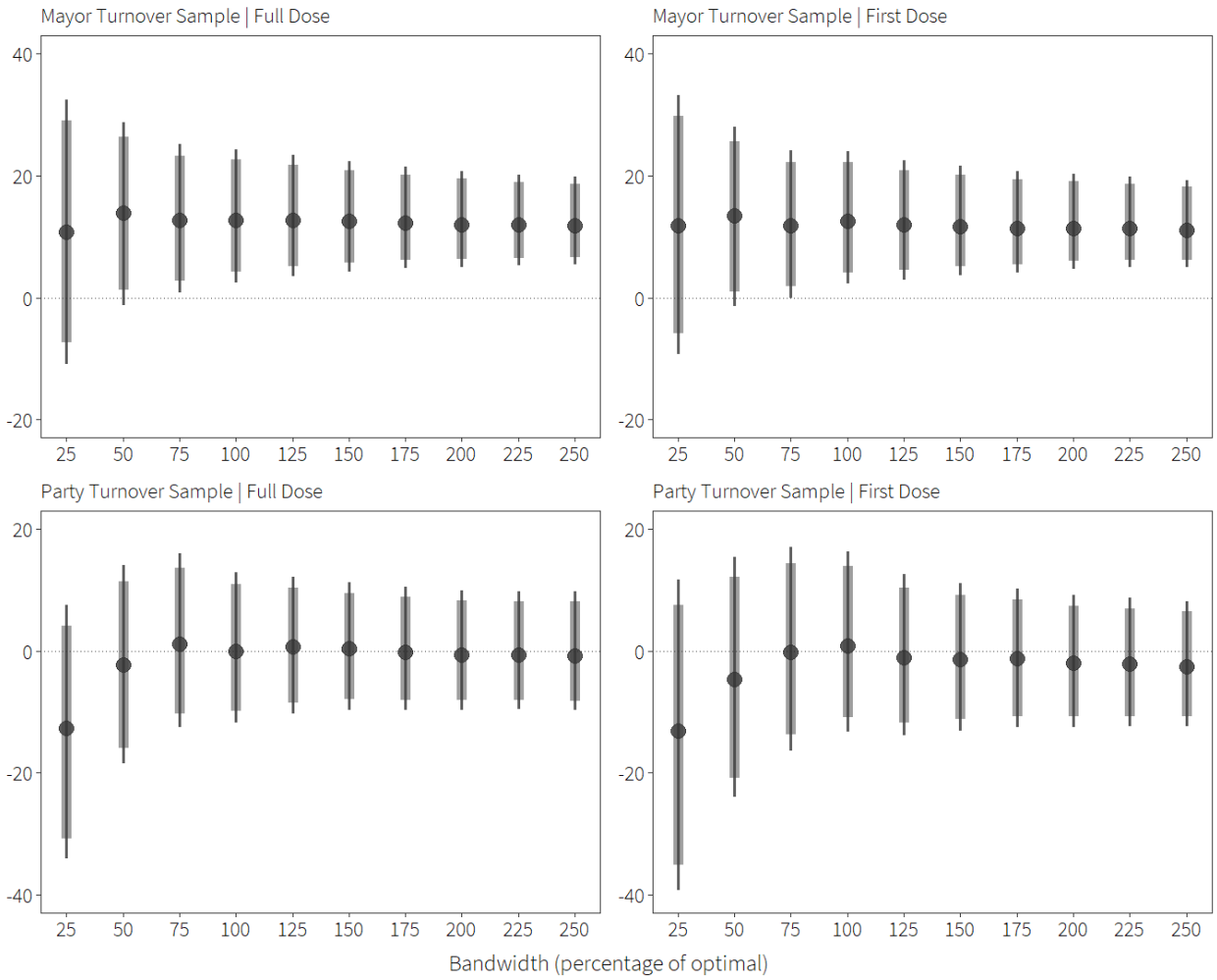
The p-values for the density tests are 0.97 and 0.91; respectively.

Figure A.2: Margin of Victory for all Incumbent Mayors that Ran in 2020



The Margin of Victory is the difference in vote percentage between the incumbent and the runner-up for elections where incumbents won (positive values); and the difference between the incumbent and the winner for elections where incumbents lost (negative values).

Figure A.3: Robustness of Effects to Bandwidth Choice



The coefficients correspond to β_1 in equation 1. The thin (wide) bars correspond to the 95% (90%) confidence intervals.

Table A.1: Continuity of Municipal and Candidate Covariates | Party Turnover Sample

	Coef.	S.E.	90% C.I.	Baseline	Band.	Munis.
Number of Voters (per '000)	0.406	(0.360)	[-0.17,1.01]	6.089	5.16	89
Municipal GDP	0.146	(0.242)	[-0.28,0.52]	21.350	4.34	70
COVID cases	-0.133	(0.311)	[-0.67,0.36]	26.493	5.23	89
Health Bureaucracy	-0.061	(0.299)	[-0.58,0.40]	13.123	4.04	63
Campaign Expenditure Cap	0.142	(0.202)	[-0.19,0.47]	0.155	4.13	66
Population Density	0.017	(0.016)	[-0.01,0.05]	1.026	4.58	75
Municipal Deaths in 2020	0.014	(0.113)	[-0.16,0.21]	10.402	4.61	76
2018 Bolsonaro votes	0.054	(0.077)	[-0.07,0.18]	0.380	5.05	83
Mayor | Race	0.096	(0.175)	[-0.18,0.39]	0.550	4.83	80
Mayor | College	0.005	(0.166)	[-0.28,0.27]	0.578	5.64	94
Mayor | Left-Wing	0.061	(0.132)	[-0.14,0.29]	0.092	4.48	72
Mayor | Health Care	-0.040	(0.090)	[-0.20,0.10]	0.072	4.04	63
Mayor | Female	0.180	(0.111)	[0.00,0.36]	0.047	4.79	79
Share of Health Bureaucracy in:						
Primary Care	0.089	(0.072)	[-0.02,0.22]	0.539	3.63	59
Doctors	0.022+	(0.014)	[0.00,0.05]	0.057	4.20	67
Nurses	0.014	(0.035)	[-0.04,0.07]	0.229	4.97	82
Health Agents	0.057	(0.042)	[0.00,0.13]	0.251	3.10	52
Other in Health	-0.074	(0.058)	[-0.18,0.01]	0.418	3.84	63
Managers	-0.012	(0.017)	[-0.04,0.02]	0.040	4.84	80

+p<0.1, *p<0.05. Standard errors (parenthesis) and 90% confidence intervals are bias-robust. The *Coefficient* is the difference on the outcome between winners and losers, and the baseline is the average outcome for losers, both at the discontinuity. Bandwidths are optimal.

Variables: (1) Number of valid votes in the 2020 mayoral race (logged); (2) GDP per voter, average of 2018-2020 in R$ (logged); (3) COVID cases per 1,000 voters in 2020 (logged); (4) Municipal bureaucrats working on health services in Oct 2020, per 1,000 voters (logged); (5) The municipal cap for campaign spending by mayor in 2020, in R$ million (logged); (6) density ('000 voters divided by km2 area, logged); (7) total deaths in 2020 in the municipality per 1,000 voters (logged); (8) vote share for Bolsonaro in the second round of the 2018 presidential election; (9-13) Binary variables that indicate whether the mayoral candidate is white (9); has a 4-year, university degree (10); belongs to a Left-wing party (11) – Left-wing parties are PDT, PSB, PCdoB, PSOL, PT, PMN, and CIDADANIA; is a doctor or a nurse (12); and is female (13); (14-19) Share of the municipal bureaucracy working in different sub-areas health care, by type: (14) in primary care (doctors, nurses, or health agents); (15) doctors; (16) nurses; (17) health agents; (18) managers; and (19) others.

Table A.2: Continuity of Municipal and Candidate Covariates | Mayor Turnover Sample

	Coef.	S.E.	90% C.I.	Baseline	Band.	Munis.
Number of Voters (per '000)	0.104	(0.206)	[-0.22,0.46]	7.931	3.55	221
Municipal GDP	0.140	(0.162)	[-0.11,0.42]	25.972	3.32	210
COVID cases	0.278	(0.248)	[-0.10,0.72]	19.868	3.03	194
Health Bureaucracy	0.037	(0.088)	[-0.10,0.19]	15.560	2.92	188
Campaign Expenditure Cap	0.125	(0.123)	[-0.06,0.34]	0.159	3.02	194
Population Density	0.050	(0.039)	[-0.01,0.11]	1.018	2.99	194
Municipal Deaths in 2020	0.081	(0.072)	[-0.03,0.20]	10.323	3.23	205
2018 Bolsonaro votes	0.034	(0.042)	[-0.04,0.10]	0.441	4.57	277
Mayor | Race	0.086	(0.103)	[-0.09,0.25]	0.635	3.62	226
Mayor | College	-0.081	(0.114)	[-0.27,0.10]	0.478	3.31	209
Mayor | Left-Wing	0.067	(0.093)	[-0.08,0.23]	0.154	2.94	191
Mayor | Health Care	0.041	(0.051)	[-0.04,0.13]	0.029	3.71	232
Mayor | Female	-0.154+	(0.094)	[-0.32,-0.01]	0.295	2.98	193
Share of Health Bureaucracy in:						
Primary Care	-0.021	(0.025)	[-0.06,0.02]	0.631	2.80	178
Doctors	0.014	(0.011)	[0.00,0.03]	0.070	2.86	182
Nurses	0.006	(0.016)	[-0.02,0.03]	0.250	2.65	170
Health Agents	-0.038	(0.027)	[-0.09,0.00]	0.309	2.39	158
Other in Health	0.016	(0.024)	[-0.02,0.06]	0.345	2.64	169
Managers	0.003	(0.006)	[-0.01,0.01]	0.025	3.36	213

+p<0.1, *p<0.05. Standard errors (parenthesis) and 90% confidence intervals are bias-robust. The *Coefficient* is the difference on the outcome between winners and losers, and the baseline is the average outcome for losers, both at the discontinuity. Bandwidths are optimal.

Variables: (1) Number of valid votes in the 2020 mayoral race (logged); (2) GDP per voter, average of 2018-2020 in R$ (logged); (3) COVID cases per 1,000 voters in 2020 (logged); (4) Municipal bureaucrats working on health services in Oct 2020, per 1,000 voters (logged); (5) The municipal cap for campaign spending by mayor in 2020, in R$ million (logged); (6) density ('000 voters divided by km2 area, logged); (7) total deaths in 2020 in the municipality per 1,000 voters (logged); (8) vote share for Bolsonaro in the second round of the 2018 presidential election; (9-13) Binary variables that indicate whether the mayoral candidate is white (9); has a 4-year, university degree (10); belongs to a Left-wing party (11) – Left-wing parties are PDT, PSB, PCdoB, PSOL, PT, PMN, and CIDADANIA; is a doctor or a nurse (12); and is female (13); (14-19) Share of the municipal bureaucracy working in different sub-areas health care, by type: (14) in primary care (doctors, nurses, or health agents); (15) doctors; (16) nurses; (17) health agents; (18) managers; and (19) others.

Table A.3: RD Effects: Robustness to Covariates and a Quadratic Polynomial

Sample:	MAYOR TURNOVER		PARTY TURNOVER ONLY	
	Full Dose	1st Dose	Full Dose	1st Dose
Specification: Includes Covariates				
Effect	9.303*	8.012*	-2.809	-4.576
	(3.833)	(3.876)	(4.743)	(5.136)
C.I. (95%)	[2.39,17.42]	[0.83,16.02]	[-12.24,6.36]	[-14.18,5.95]
Bandwidth	2.74	2.87	5.97	4.79
Municipalities	362	380	197	168
Specification: Includes Covariates & State Fixed Effects				
Effect	5.416*	6.056*	-4.058	-5.920
	(2.850)	(3.089)	(3.618)	(3.811)
C.I. (95%)	[0.21,11.38]	[0.37,12.48]	[-11.31,2.87]	[-12.99,1.95]
Bandwidth	2.74	2.87	5.97	4.79
Municipalities	362	380	197	168
Quadratic Polynomial				
Effect	12.790*	11.935*	1.196	-0.593
	(5.491)	(5.551)	(6.388)	(7.731)
C.I. (95%)	[2.31,23.83]	[1.20,22.96]	[-11.04,14.00]	[-15.33,14.98]
Bandwidth	5.89	5.87	11.42	8.69
Municipalities	726	722	360	293

+p<0.1, *p<0.05. The effect always corresponds to β_1 in equation 1, for each specification. Standard errors and 95% confidence intervals are bias-robust. All variables are explained in the text.

Table A.4: RD Effects: Robustness to Outcome Definition

Variable:	Total	Full Dose			
	Shots	Residents	2021-2022	2010 Pop.	2010 Pop. 12+
	(1)	(2)	(3)	(4)	2010 Pop. 12+
Mayor Turnover Sample					
Effect	28.107*	10.615*	13.367*	7.769*	8.857*
	(12.490)	(5.076)	(5.817)	(3.299)	(3.462)
C.I. (95%)	[5.10,54.06]	[1.31,21.21]	[2.64,25.45]	[1.79,14.72]	[2.58,16.15]
Baseline	236.875	81.127	116.977	68.562	85.426
Bandwidth	2.76	3.11	2.86	2.77	2.86
Municipalities	363	409	376	363	377
Party Turnover Sample					
Effect	-1.814	8.194	-0.800	-4.469	-4.455
	(14.631)	(7.242)	(7.128)	(5.425)	(5.364)
C.I. (95%)	[-29.52,27.84]	[-4.94,23.45]	[-14.25,13.69]	[-14.72,6.55]	[-14.98,6.04]
Baseline	241.421	77.569	119.327	78.704	95.985
Bandwidth	5.87	4.38	5.76	4.75	5.83
Municipalities	196	154	195	167	195

+p<0.1, *p<0.05. The effect always corresponds to β_1 in equation 1, for each specification. Standard errors and 95% confidence intervals are bias-robust. All variables are explained in the text.
Outcome definition: Column (1) uses the total vaccine shots given in 2021 in the municipality, divided by the number of votes in 2020; column (2) uses the full doses given in 2021 to residents in the municipality, divided by the number of votes in 2020; column (3) aggregates the full doses given in the municipality in 2021 and 2022, divided by the number of votes in 2020; column (4) has the full doses given in the municipality in 2021, as the main outcome, but now divided by the total municipal population; and column (5) has again the full doses given in the municipality in 2021, but now divided by the total municipal population above 12 (the population data is measured in 2010 by the Census).

Table A.5: RD Effects on Deaths

Outcome	DEATHS IN 2021		DEATHS IN 2021-2022	
Covariates?	No	Yes	No	Yes
Mayor Turnover Sample				
Effect	-0.102	-0.116*	-0.082+	-0.092*
	(0.062)	(0.060)	(0.048)	(0.047)
C.I. (95%)	[-0.22,0.02]	[-0.23,0.00]	[-0.18,0.01]	[-0.19,0.00]
Baseline	1.369	1.369	1.275	1.275
Bandwidth	3.60	3.60	3.60	3.60
Municipalities	467	467	467	467
Party Turnover Sample				
Effect	0.029	-0.006	0.037	0.021
	(0.132)	(0.124)	(0.100)	(0.092)
C.I. (95%)	[-0.24,0.27]	[-0.25,0.23]	[-0.17,0.22]	[-0.16,0.20]
Baseline	1.280	1.280	1.203	1.203
Bandwidth	3.91	3.91	4.08	4.08
Municipalities	141	141	145	145

+p<0.1, *p<0.05. The outcome is also the annual deaths in the municipality (period average for 2021-2022), divided by the total deaths in 2019 (pre-COVID). The effect always corresponds to β_1 in equation 1, for each specification. Standard errors and 95% confidence intervals are bias-robust.

Table A.6: Effect including large cities with two-round elections

Sample:	MAYOR TURNOVER		PARTY TURNOVER ONLY	
	Full Dose	1st Dose	Full Dose	1st Dose
Effect	12.692*	12.547*	-1.704	-1.006
	(5.597)	(5.547)	(6.452)	(7.486)
C.I. (95%)	[2.43,24.38]	[2.29,24.04]	[-13.93,11.37]	[-15.19,14.15]
Baseline	101.214	116.744	104.991	118.482
Bandwidth	2.72	2.84	5.93	4.97
Municipalities	359	373	199	176

+p<0.1, *p<0.05. The effect corresponds to β_1 in equation 1. Standard errors and 95% confidence intervals are bias-robust. All variables are explained in the main text. The Baseline is the average outcome for the municipalities that reelected newcomers (control group), at the cutoff.

Table A.7: RD Effects: Dismissals and New Hires

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dismissals							
Party Turnover	-3.753*	-1.575*	-0.016	-0.964*	-0.595*	-0.238*	-1.940*
	(1.351)	(0.565)	(0.116)	(0.319)	(0.255)	(0.085)	(0.929)
Mayor Turnover	-1.686*	-0.637*	0.057	-0.441*	-0.254*	-0.158*	-0.891*
	(0.439)	(0.250)	(0.107)	(0.139)	(0.117)	(0.053)	(0.262)
Difference (M - P)	2.067	0.937	0.073	0.523	0.341	0.081	1.049
	(1.421)	(0.618)	(0.158)	(0.348)	(0.280)	(0.100)	(0.965)
New Hires							
Party Turnover	-2.929*	-0.990+	0.129	-0.649+	-0.470+	-0.139	-1.800*
	(1.006)	(0.600)	(0.130)	(0.356)	(0.269)	(0.109)	(0.496)
Mayor Turnover	-1.157*	-0.266	0.209	-0.329*	-0.146	-0.067	-0.823*
	(0.590)	(0.290)	(0.142)	(0.163)	(0.125)	(0.051)	(0.401)
Difference (M - P)	1.772	0.723	0.080	0.320	0.323	0.072	0.977
	(1.167)	(0.666)	(0.192)	(0.392)	(0.296)	(0.120)	(0.638)
Municipalities (P)	133	133	133	133	133	133	133
Municipalities (M)	439	439	439	439	439	439	439

+p<0.1, *p<0.05. The coefficients correspond to β_1 in equation 1, for each sample and specification as indicated. Standard errors and 95% confidence intervals are heteroskedasticity-robust. The outcomes are always defined as the number of health care workers in each category, per 1,000 voters. Hires and dismissals consider the period between Oct 2020 and Dec 2021. **Outcomes by column. (1):** total health care workers; **(2):** total primary care workers (doctors + nurses + health agents); **(3):** doctors; **(4):** nurses; **(5):** health agents; **(6):** managers; **(7):** other health care workers.

Table A.8: RD Effects: Turnover and Net Hires

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Turnover							
Party Turnover	-6.682*	-2.564*	0.113	-1.613*	-1.065*	-0.378*	-3.740*
	(2.181)	(1.110)	(0.207)	(0.651)	(0.489)	(0.170)	(1.292)
Mayor Turnover	-2.843*	-0.904+	0.266	-0.770*	-0.400+	-0.225*	-1.714*
	(0.960)	(0.497)	(0.224)	(0.280)	(0.226)	(0.094)	(0.592)
Difference (M - P)	3.839	1.660	0.153	0.843	0.665	0.153	2.026
	(2.383)	(1.216)	(0.305)	(0.708)	(0.539)	(0.194)	(1.421)
Net Hires							
Party Turnover	0.824	0.585+	0.145	0.315+	0.126	0.099	0.140
	(0.959)	(0.353)	(0.134)	(0.182)	(0.187)	(0.097)	(0.741)
Mayor Turnover	0.529	0.371+	0.151	0.112	0.108	0.091*	0.067
	(0.401)	(0.217)	(0.116)	(0.118)	(0.088)	(0.042)	(0.330)
Difference (M - P)	-0.295	-0.214	0.007	-0.203	-0.018	-0.008	-0.072
	(1.039)	(0.414)	(0.177)	(0.217)	(0.206)	(0.106)	(0.811)
Municipalities (P)	133	133	133	133	133	133	133
Municipalities (M)	439	439	439	439	439	439	439

+p<0.1, *p<0.05. The coefficients correspond to β_1 in equation 1, for each sample and specification as indicated. Standard errors and 95% confidence intervals are heteroskedasticity-robust. The outcomes are always defined as the number of health care workers in each category, per 1,000 voters. Turnover is the sum of hires and dismissals, net hires is the difference between them. Hires and dismissals consider the period between Oct 2020 and Dec 2021. **Outcomes by column. (1):** total health care workers; **(2):** total primary care workers (doctors + nurses + health agents); **(3):** doctors; **(4):** nurses; **(5):** health agents; **(6):** managers; **(7):** other health care workers.

Table A.9: RD Effects on Vaccine Acquisition

Outcome	VACCINES RECEIVED UNTIL JULY 2023		TOTAL SHOTS PER DOSE RECEIVED	
Covariates?	No	Yes	No	Yes
Effect	-2.383	-10.103	89.414*	111.989*
	(13.094)	(10.765)	(46.215)	(47.540)
C.I. (95%)	[-28.83,22.50]	[-32.21,9.99]	[21.34,202.50]	[42.13,228.49]
Baseline	259.297	259.297	90.376	90.376
Bandwidth	3.16	3.16	2.51	2.51
Municipalities	405	405	329	329

+p<0.1, *p<0.05. The first outcome considers the total number of doses received between January 2021 and July 2023, as a % share of voters. The second outcome is the total number of shots given in the period, as a % of doses received. The effect always corresponds to β_1 in equation 1, for each specification. Standard errors and 95% confidence intervals are bias-robust.

Table A.10: RD Effect for Infant Vaccinations in 2017

Sample:	MAYOR TURNOVER		PARTY TURNOVER ONLY	
	Full Dose	1st Dose	Full Dose	1st Dose
Effect	8.965	5.050	4.823	-0.009
	(6.914)	(4.401)	(9.217)	(5.642)
C.I. (95%)	[-4.32,22.78]	[-3.60,13.65]	[-14.10,22.03]	[-11.75,10.36]
Baseline	79.289	56.853	79.307	58.935
Bandwidth	4.38	4.39	4.61	4.89
Municipalities	525	527	194	202

+p<0.1, *p<0.05. The effect corresponds to β_1 in equation 1. Standard errors and 95% confidence intervals are bias-robust. All variables are explained in the main text. The Baseline is the average outcome for the municipalities that reelected newcomers (control group), at the cutoff.