Turnover: How electoral accountability disrupts the bureaucracy and service delivery*

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Abstract

Electoral accountability is fundamental to representative democracy. Yet, it can also be costly for governance because it causes turnover among bureaucrats (not just politicians) and disruptions in the delivery of public services. Most research on the connections between political and bureaucratic turnover emphasizes how incoming governments reshape the bureaucracy. This article argues that election losers also engage in bureaucratic shuffles before leaving office, and that their actions can depress public service delivery. I demonstrate these turnover dynamics through a close-races regression discontinuity design, using administrative data on the universe of government employees and on healthcare services in Brazilian municipalities. Results show that an electoral defeat of the incumbent causes dismissals of temporaries, hires of civil servants, and declines in healthcare services before the winner takes office. These findings highlight the political strategies of lame-duck politicians and the consequential bureaucratic politics that follow elections.

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1 Introduction

Przeworski famously defined democracy as "a system in which parties lose elections" (1991, 10). In fact, political turnover is at the center of many concepts of democracy. Theories of both retrospective (Manin, 1997) and prospective accountability (Fearon, 1999), elitist theories of democracy (Popper, 1962), and populist and libertarian critiques of professional politics (Kurfirst, 1996) all see political turnover as a fundamental ingredient of democracy. Empirically, the recurrence of political turnover is often taken as an indicator of democratic consolidation (Schedler, 2001).

This article argues that, its many benefits notwithstanding, political turnover imposes important costs, at least in the short term, through concurrent dynamics of bureaucratic turnover and disruptions to public service delivery.[1] I build on recent studies in political science, public administration, and economics that have shown there are important connections between political and bureaucratic turnover, both in high- and low-income settings. Scholars have overwhelmingly focused on how election winners shape the bureaucracy upon taking office, be it by hiring their supporters (Colonnelli et al., 2020; Brassiolo et al., 2020) or by firing or transferring existing bureaucrats (Akhtari et al., 2020; Fagernäs and Pelkonen, 2020; Iyer and Mani, 2012). Studies on high-income democracies have focused almost exclusively on the turnover of high-level bureaucrats, which would result from decisions by the new government (Cooper et al., 2020; Dahlström and Holmgren, 2019; Kim and Hong, 2019) or from resignations by bureaucrats who anticipate or respond to conflicts with the incoming administration (Bolton et al., 2020; Doherty et al., 2019a,b).

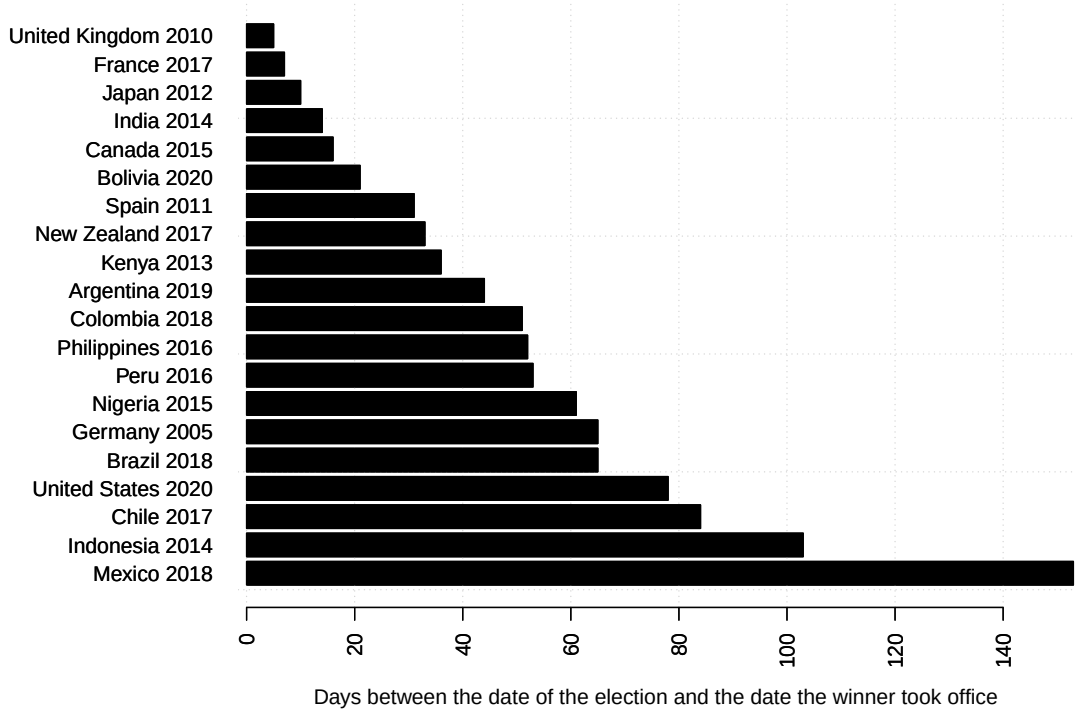
In contrast to previous studies, this article emphasizes the political strategies of lame-duck governments and their detrimental effects on the delivery of public services. In particular, I argue that –at least in contexts where politicians have formal or informal discretion over the bureaucracy, and where bureaucratic norms for autonomous performance are weak– an electoral defeat of the incumbent leads to both dismissals and hires of bureaucrats as well as to declines in public service delivery in the period *before* the winner takes office. These effects are driven by lame-ducks' unique political incentives and by bureaucrats' strategic responses to them. By studying how bureaucracies are disrupted immediately after elections, this article highlights the bureaucratic politics of transition periods, which have received scant attention to date. This is, to the best of my knowledge, the

[1] Throughout the article, I refer to the political turnover that occurs in consolidated democracies as a result of regular and generally accepted elections. Political turnover resulting from coups, revolutions, and irregular elections is likely to have more disruptive effects on bureaucracies and service delivery.

first study to demonstrate how lame-duck politics can hurt the delivery of public services.[2]

Understanding the politics of transition periods (i.e., the time between the day an election is held and the day when the winner takes office) is important for at least two reasons. First, these periods are often long. Using data on recent transition periods across a diverse sample of democracies, Figure 1 shows that election losers often remain in office for weeks or months after the election. Second, election losers have a unique set of concerns and motivations, which they can pursue through their executive authority while they are still in office. Chief among lame ducks' concerns are preparing themselves for the vulnerability that comes after losing office, and setting the bases for their (or their political party's) return to office. At the same time, lame-ducks have diminished incentives and ability to monitor bureaucrats and to get them to deliver services to citizens. The connection between electoral defeat and bureaucratic disruptions draws attention to these unique incentives of lame-ducks and their impact on democratic politics.

Figure 1: Recent transition periods in a sample of 20 democracies



For each country, observation corresponds to the latest instance when a new party got to office through popular election. See Appendix A for details.

[2]Two recent studies have examined the effect of turnover on student test scores (Akhtari et al., 2020; Fagernäs and Pelkonen, 2020), but none have looked at service provision itself.

Although accounts of the influence of lame-duck governments on the bureaucracy are common, we have little systematic evidence on how election losers impact the composition and the performance of the bureaucracy before leaving office, and how deep these effects go. Does the result of the election depress the delivery of essential public services in the months before the winner takes office? Does electoral turnover lead to the hiring and firing of bureaucrats during that period? If so, is bureaucratic turnover the main mechanism through which an incumbent defeat at the polls reduces service delivery? Answers to these questions have important implications for policy debates on public sector reform, including the role of civil service systems and anti-corruption efforts for improving bureaucratic performance.

This article empirically investigates the effects of electoral turnover on bureaucratic shuffles and on public service delivery through a close-races regression discontinuity design (Eggers et al., 2015), leveraging data on public employment and healthcare services in Brazilian municipalities. To identify the causal effect of an electoral defeat of the incumbent, I compare outcomes in municipalities where the mayor barely loses to those where they barely win the reelection. I complement these causal estimates with qualitative evidence from in-depth interviews I conducted with politicians and prosecutors in several states.[3]

Brazilian municipal governments are an ideal case to study the link between political turnover, bureaucratic turnover, and public service delivery. Municipalities in Brazil hire large numbers of bureaucrats in order to provide primary services of healthcare, education, and social assistance to over 200 million people. Mayors, who are elected in majoritarian elections, have some discretion over the bureaucracy they oversee. Bureaucrats can be hired with civil service contracts (which have life tenure) or with temporary contracts. Elections are held simultaneously in all municipalities on the first Sunday of October every four years, and winners take office on January 1st. A final but critical advantage of the Brazilian case is the availability of detailed administrative data on public employment and on healthcare services.

Two additional reasons motivate my focus on healthcare. First, healthcare is the policy area most salient to voters at the local level (Boas et al., 2019, 395; Reis, 2016). If we observe effects on healthcare we are likely to also find effects in other areas of government activity that are less visible and/or important to citizens. Second, municipal healthcare services in Brazil have been shown to reduce child mortality (Rocha and Soares, 2010; Aquino et al., 2009), a common proxy for health outcomes in the developing world. If election results depress the delivery of these basic healthcare

[3]See Appendix B for details about the interviews.

services they may therefore hurt human development.

I examine the effects of an electoral defeat of Brazilian mayors on the turnover of bureaucrats at different levels of the bureaucracy (from managers to frontline service providers) and with different contracts (temporary or civil service) as well as on the delivery of key healthcare services. To do so I leverage administrative data on the universe of government employees –which allows me to identify effects on dismissals, hires, and resignations– and administrative healthcare data. Combining data for four election cycles (2004 - 2016), I examine how an electoral defeat of the incumbent affects each outcome in the last quarter of their mandate, before the winner is sworn in. By using quarterly rather than yearly data, I am able to overcome a key limitation in previous studies and differentiate the effects of electoral turnover under lame-duck government and under the incoming administration.

Regression discontinuity results show that electoral defeat unleashes significant dynamics of bureaucratic turnover in the months following the election, both in the bureaucracy overall and among frontline service providers. This counters two common assumptions in the literature on turnover, namely that the connection between political and bureaucratic turnover is driven by the actions of election winners alone and that turnover affects only high-level bureaucrats. Under lame-duck governments there are large increases in the dismissal of temporary workers and in the hiring of civil servants. Interview evidence suggests that lame-duck politicians resort to dismissals in order to improve their compliance with legal rules about hiring before leaving office; and that they sometimes hire civil servants to stack the deck against the election winner by limiting their fiscal capacity to hire their own supporters once in office. Resignations of bureaucrats also increase in the months immediately following the defeat of the incumbent. Last, and in line with previous studies, I find that political turnover causes significant increases in the hiring of temporary workers once the election winner takes office.

An electoral defeat of the incumbent also causes significant declines in healthcare services during the transition period, which suggests lame-duck governments can hurt citizen welfare. In particular, home visits by nurses and doctors, prenatal care check-ups, and medical consultations with infants and children all decline in the last quarter of the mayor's mandate. While bureaucratic turnover can depress public service delivery, the evidence suggests that dismissals are *not* the main mechanism behind these declines and that civil service bureaucracies are not immune to the negative effects of an electoral defeat on performance. Instead, the downturn in healthcare services appears to be driven by a worsening of bureaucratic accountability under lame-duck governments, where

politicians and senior officials are less able and/or willing to monitor and motivate bureaucrats.

In sum, this article advances our understanding of political turnover –a critical moment of democratic politics– by highlighting the unique political incentives of lame-ducks, how they shape the bureaucracy before leaving office, and the impact they have on the delivery of essential services. These are key aspects of political turnover that previous research has generally overlooked. I support this argument with quasi-experimental evidence from the Brazilian case, complemented by qualitative insights from interviews with politicians and prosecutors.

2 Bureaucratic politics during transition periods

Does political turnover disrupt the bureaucracy? Previous studies have shown that it does, especially through the turnover of high-level bureaucrats (Bolton et al., 2020; Doherty et al., 2019a; Dahlström and Holmgren, 2019; Christensen et al., 2014) and the decisions election winners take once in office (Colonnelli et al., 2020; Akhtari et al., 2020; Brassiolo et al., 2020). Still, this literature has neglected the critical role that election losers play in the connection between political and bureaucratic turnover, and how lame-duck governments can depress public service delivery. This article fills that gap by offering and testing a theory of lame-duck incumbents and how they shape both the composition of the bureaucracy (through hires and fires) and its performance.

I argue that the dynamics of turnover are shaped by the incentives, concerns, and constraints of politicians. Turnover dynamics thus differ systematically under lame-duck government and the new administration, and for temporary versus civil service employees. While both election losers and winners make use of their (formal and informal) discretion over the bureaucracy to pursue their goals, their divergent incentives and concerns lead to distinct turnover dynamics before and after the winner takes office. The intensity of these dynamics may be moderated by institutional constraints like legal limits on politicians' discretion over the bureaucracy, but such constraints are unlikely to completely eliminate these phenomena.[4]

The strategies of lame-duck governments are shaped by two key motivations: preparing them-

[4]A change in government has been shown to lead to the turnover of bureaucrats with strong employment protections and formally insulated from politics, even in contexts of high state capacity. Examples include agency heads in Sweden (Dahlström and Holmgren, 2019), chief executive officers of state-owned firms in South Korea (Kim and Hong, 2019), and senior civil servants in the United States (Doherty et al., 2019b).

selves for the vulnerability that comes after losing office, and setting the bases for a return to power. I argue that politicians who lose a reelection bid become more vulnerable to prosecution and conviction, for two key reasons. First, they lose some of their ability to exert formal and informal pressures over horizontal accountability actors. Second, their opponents get access to the government's accounts and thus gain information about potential malfeasance. Recent research has shown that losing power increases politicians' chances of being convicted in India (Poblete-Cazenave, 2020) and Brazil (Lambais and Sigstad, 2020), despite judges' strong formal protections from political pressures in both countries.[5] At the same time, politicians who lose a reelection bid are arguably concerned with maximizing their (or their political party's) chances of returning to office.

This perspective on lame-duck politicians as actors seeking to maximize their chances of returning to power and to minimize their vulnerability to prosecution suggests they may engage in two strategic uses of bureaucratic shuffles during their remaining time in office.[6] First, lame-duck governments may use dismissals as a strategy to "clean the accounts" and reduce the chances that they will be prosecuted upon leaving office. Around the world, it is common for politicians to expand the bureaucracy ahead of elections to boost their reelection chances (Cahan, 2019; Pierskalla and Sacks, 2019; Toral, 2019). In contexts where such hiring strategies violate electoral, procedural or fiscal rules, politicians may seek to undo some of that bureaucratic expansion after the election in order to protect themselves from prosecution. I thus hypothesize that dismissals of temporary workers will increase after the incumbent loses the election (Hypothesis 1).

On the other hand, lame-duck governments may use hires in the civil service to constrain their opponents, either in policy or in fiscal terms.[7] As a strategy to constrain policy, election losers may hire senior civil servants in order to preserve their policy legacy. This phenomenon has been observed in the United States, where some presidents "burrow" political appointees into the civil service at the end of their mandate (Lewis, 2008; Mendelson, 2003). Alternatively, election losers may use the hiring of civil servants (who have significant job security) as a strategy to reduce

[5]Relatedly, there is evidence that opposition politicians in the United States are more vulnerable to prosecution (Davis and White, 2019; Gordon, 2009).

[6]While I focus on how lame ducks pursue these goals through bureaucratic shuffles, they may advance them by other means (e.g., regulation).

[7]This rationale mirrors that of so-called midnight judicial appointments (Turner, 1960) or midnight regulations (Brito and De Rugy, 2009) approved by US Presidents before leaving office. In a similar vein, Mexican states have been found more likely to pass transparency laws during lame-duck governments (Berliner and Erlich, 2015).

the fiscal capacity of the new administration to hire their own supporters. Civil service hiring is typically seen as insulated from politics because civil servants are selected after passing objective, competitive examinations. In practice, however, candidates who pass a civil service exam are often not hired automatically. Instead, at least in some civil systems of the Napoleonic tradition, approved candidates are added to a ranked list, and they are hired in order of performance as personnel needs arise. In certain contexts, therefore, lame-duck governments are legally able to expand the civil service by simply hiring pre-approved candidates. By making strategic use of their discretion over the timing of civil service hiring, election losers can reduce their opponent's ability to hire their own supporters and thus increase their own chances of getting back to power in the future. Hypothesis 2 is that civil service hiring will increase under lame-duck governments.

The hypothesis that election losers will increase hiring in the civil service builds on and expands debates about the political origins civil service reform. Geddes (1994) famously argued that politicians face a "dilemma" about the establishment of civil service reforms because they are split between their individual need for political control and their collective interest in building state capacity. Therefore, she argued, politicians would make a collective investment in civil service reform when patronage is distributed evenly among key players. Building on her work, others have argued that civil service reform is more likely when exit from office is imminent (Ting et al., 2013) or certain (Schuster, 2020), as a way to constrain the incoming government. In countries where a civil service regime already exists that logic can be extended to quantitative expansions of civil service hiring, which lame-ducks can use to tie the hands of their opponent.

The strategy of hiring civil servants before leaving office can pay off politically because election winners typically seek to induct political supporters into the bureaucracy. There are two distinct rationales for an incoming government to do this. One rationale is using bureaucratic appointments to reward campaign supporters (Colonnelli et al., 2020; Brassiolo et al., 2020). A different logic is to use appointments to better control public policy and implementation (Lewis, 2008; Peters and Pierre, 2004). In both cases we should expect election winners to increase hiring of temporary workers in their first few months in office.

Incumbent bureaucrats can actively respond to the political strategies of outgoing and incoming politicians, thereby shaping the turnover dynamics of transition periods. One way bureaucrats may react to the changing political environment is by resigning. If bureaucrats prefer to work for organizations whose leaders have preferences aligned to theirs, or if they anticipate new leaders will mistreat them (e.g., by firing or transferring them), they may choose to leave the bureaucracy

(Bolton et al., 2020; Doherty et al., 2019a). Resignations could also ensue if bureaucrats simply dislike working during the transition period, when responsibilities are less clear and organizational and policy changes abound. In any case, we would expect to see resignations increase in the months following electoral turnover.

An electoral defeat of the incumbent affects not only the composition of the bureaucracy but also its performance. Hypothesis 3 is that public service delivery declines in the months following the election as a result of an electoral defeat of the incumbent. Several mechanisms could drive such an effect. The few studies that have measured the impact of political turnover on development outcomes focus on bureaucratic turnover as the main explanation (Akhtari et al., 2020; Fagernäs and Pelkonen, 2020). Dismissals and hires can lead to the exit of bureaucrats with job-specific experience and know-how, and to the entry of other bureaucrats with less endowments of both (Akhtari et al., 2020). Turnover can also lead to the selection of systematically worse bureaucrats, for example if politicians prioritize loyalty over competence (Colonnelli et al., 2020). The mere disruption of teams of providers, for example through transfers, may have a negative impact on public service delivery (Fagernäs and Pelkonen, 2020; Hanushek et al., 2016) because bureaucratic effectiveness often depends on the stability of the organizations and teams they are embedded in (Kraft et al., 2016). Renewed leadership and the inflow of new employees may well have a positive effect on performance, but those effects are unlikely to show in the first few months of a new administration due to the costs of policy and managerial switches as well as learning.

An electoral defeat of the incumbent can also hurt bureaucratic performance through mechanisms other than bureaucratic turnover. First, an electoral defeat may lead to disruptions in procurement and contracts for services and goods on which bureaucrats depend to provide services. Second, an electoral defeat may hurt performance if bureaucrats respond strategically to the changing political environment by decreasing their level of effort. At least in the developing world, bureaucrats' effort and performance respond to monitoring and accountability pressures from politicians (Raffler, 2020; Dasgupta and Kapur, 2020; Gulzar and Pasquale, 2017). Yet, the ability and/or the willingness of politicians and senior officials to monitor and motivate bureaucrats is likely to decrease sharply once all actors know the government will change in a few weeks or months. Bureaucrats' level of effort and performance may therefore decline under lame-duck governments, even in the absence of bureaucratic turnover.

To sum up, I advance a theory of the politics of transition periods whereby an electoral defeat of the incumbent causes bureaucratic turnover and declines in public service delivery. In contrast

to previous research on turnover, this theory emphasizes the critical role of election losers as well as bureaucrats' response to a changing political environment, and their detrimental effect on public service delivery.

3 Institutional setting

Brazilian local governments have a number of characteristics that make them an ideal case to examine the effects of political turnover on bureaucratic turnover and on public service delivery. In this context, bureaucracies are large and responsible for major public services, politicians have some discretion over the hiring and firing of bureaucrats, elections are generally competitive, and transition periods are relatively long.

Municipal elections take place every four years on the first Sunday of October, and consist of simultaneous elections for a mayor, who is elected through a majoritarian system,[8] and for a variable number of city councilors, who are elected though a proportional, open-list system. Mayors can run for reelection only once. Local elections are generally competitive – in the 2016 elections, almost 49% of the incumbents who ran were defeated.[9] Politicians are overseen by a network of horizontal accountability actors, including judges, auditors, and prosecutors, which have been shown to reduce rent extraction (Litschig and Zamboni, 2019; Avis et al., 2018). There are currently 5,570 municipalities,[10] most of which are small and poor.[11]

Municipal governments are responsible for providing primary services in healthcare, education, and social assistance. Therefore, the local government workforce is typically large. On average, municipal governments hired in 2016 4.9% of the local population and 38.2% of those employed in the formal labor market.[12] Municipal employees enjoy a wage premium relative to the private sector (Colonnelli et al., 2020, 3090), similarly to other developing contexts (Finan et al., 2017). Despite

[8] In municipalities with over 200,000 inhabitants (less than 2% in 2016), there is a runoff election on the last Sunday of October if no candidate obtains an absolute majority.

[9] In fact, Brazilian mayors have an incumbency *disadvantage* (Klašnja and Titiunik, 2017).

[10] The number of municipal governments in the period I study ranges from 5,559 in 2004 to 5,569 in 2017. Brasília, the capital city, is a federal district without a municipal government or municipal elections – it has a governor instead.

[11] As per the 2010 census, the median municipality had less than 12,000 inhabitants and per capita income of less than 500 Brazilian reais (or about USD284 at the exchange rate back then).

[12] Figures are from administrative data described in Section 4.3.

important improvements over the past few decades in all three areas of social policy, development challenges are substantial (Castro et al., 2019). Healthcare is typically the most salient policy area for voters in municipal elections (Boas et al., 2019, 395; Reis, 2016).

Municipalities provide primary healthcare services to all residents, free of charge, under the umbrella of the Unified Health System. To do so, they maintain "basic health units" or clinics. Each clinic is led by a manager, who is typically appointed by the mayor or the secretary of healthcare, and staffed with with doctors, nurses, and other healthcare professionals. To assist with the provision of basic healthcare services, especially preventive care and particularly in rural areas, municipalities also hire community health agents, who work promoting health, preventing diseases, and providing maternal and child services in their own community (Ministério da Saúde, 2012d). More complex healthcare, like specialist consultations and hospitalizations, are generally provided by state governments, especially for residents of small municipalities. Private healthcare provision is common in larger municipalities, but most citizens rely exclusively on the public system.[13]

Mayors and the secretaries they appoint have some discretion over the hiring and firing of bureaucrats. Such discretion differs significantly between the civil service (which makes up about two thirds of the municipal labor force) and other hiring modes with less employment protections. The Brazilian constitution mandates that all permanent staffing needs be filled with civil service contracts, where there is a competitive examination and the candidates with the best performance may be offered a position, which has tenure for life after a probationary period.[14] Critically, however, the best performers are not automatically appointed. While politicians have no discretion in the ranking of candidates, they do have discretion on the timing and numbers of civil service hires.[15] About a third of municipal employees are hired through temporary contracts,[16] which can legally be used for hiring political appointees or for hiring regular employees to fill short-term or urgent staffing needs. Temporary contracts are in practice also used sometimes in cases where the civil service should prevail, although the practice is unconstitutional and politicians may be prosecuted for it. Temporary employees generally have 1-year contracts that can be terminated by the employer

[13] In 2013, 61.13% of Brazilians used the services of a public basic health unit and 20.3% of a public hospital, compared to 18.53% who used the services of a private provider (Castro et al., 2019, 5).

[14] Once tenured, civil servants can be dismissed only in extraordinary circumstances such as being convicted for a corruption charge.

[15] This feature of civil service hiring is not unique to Brazil and can be found in other countries like Mexico.

[16] I use temporary contracts to refer to all labor contracts outside the civil service. These contracts can use a variety of labor regimes, all of which lack tenure.

much more easily than civil service contracts.

4 Research design

To estimate the causal effect of electoral turnover on bureaucratic turnover and public service delivery I rely on a close-races regression discontinuity design, essentially comparing instances where the incumbent barely loses the election to instances where they are barely reelected. I focus on the electoral performance of the incumbent mayor rather than their party because Brazilian municipal politics are characterized by weak partisan attachments (Boas et al., 2019) and pervasive party switching by politicians (Peterlevitz, 2020). Since it is common for incumbents to run for reelection with a party different from the one they got elected under,[17] examining the electoral performance of the incumbent party would be misleading.

This quasi-experimental design is important because simple comparisons of cases where incumbents win or lose the reelection are likely to be biased. If local actors anticipate that the incumbent will lose the reelection, bureaucratic turnover may be higher and public service delivery may be lower before the election. In those cases, low levels of service delivery may actually be more a cause than a consequence of the election result. Descriptive data reported in Appendix D show that municipalities where the incumbent loses the election have systematically different patterns of public service delivery in the quarter *before* the election. By examining what happens in close elections, where the outcomes are uncertain *ex ante*, we can estimate the causal effect of political turnover.

The regression discontinuity design allows me to identify the causal effect of an electoral defeat of the mayor on dynamics of bureaucratic turnover (fires, hires, and resignations) and healthcare service delivery in the two quarters immediately following the election, i.e. the months between the election and the winner being sworn in and the first three months of the winner's mandate. I use quarter-level data because the hypotheses are about turnover dynamics under the lame-duck government, which lasts a quarter in Brazil.[18]

[17] 30.4% mayors did it in 2008, 19.1% in 2012 and 26% in 2016 (TSE data).

[18] Results using month-level data (available from the author) are of similar substantive and statistical significance.

4.1 Identification

The core of regression discontinuity designs is a forcing variable, with treatment determined sharply at a given threshold along its distribution. In this case, the forcing variable for municipality i in election cycle c is the difference between the vote share of the strongest opposition candidate and the vote share of the incumbent: $D_{ic} = V_{ic}^{o} - V_{ic}^{g}$. Treatment is the electoral defeat of the mayor, which is determined sharply when the forcing variable is positive: $T_{ic} = \mathbb{1}$(vote share of the strongest challenger $>$ vote share of the incumbent).[19] Intuitively, this allows us to interpret a discontinuous jump of the outcome at the threshold as the causal effect of an electoral defeat of the mayor. The goal is to identify the difference in potential outcomes under treatment (i.e., the incumbent is defeated) and under control (i.e., the incumbent wins the reelection), namely $\tau = \mathbb{E}[Y_{1ic} - Y_{0ic}]$. We can estimate the local average treatment effect (LATE) for municipalities around the threshold[20] by taking the difference between the limits from above and from below the cutoff:

$$\tau = \mathbb{E}[Y_{1ic} - Y_{0ic} | D_{ic} = 0] = \lim_{D_{ic} \downarrow 0} \mathbb{E}[Y_{1ic} | D_{ic} = 0] - \lim_{D_{ic} \uparrow 0} \mathbb{E}[Y_{0ic} | D_{ic} = 0] \tag{1}$$

The key assumption of this design is that potential outcomes are continuous around the threshold. While this assumption is empirically untestable, we can examine some of its observable implications. Appendix E shows that the forcing variable has a roughly normal distribution and no signs of sorting or discontinuity around the threshold, as confirmed by the test proposed by McCrary (2008). Reassuringly, pre-treatment covariates are continuous around the threshold (Appendix F).

4.2 Estimation and inference

I follow the standard practice of using local linear regression with a triangular kernel smoother (Cattaneo et al., 2019),[21] and apply it to the following estimating equation:

[19] Conversely, if that difference is negative, the incumbent wins the election and there is no change of mayor on January 1st.

[20] That is, municipalities where the mayor runs and their vote share is close to that of the strongest challenger. See Appendix J for a characterization of municipalities with close elections.

[21] Results are similar using quadratic or cubic polynomials, and using uniform or Epanechnikov kernels. Results with those alternative specifications are available from the author.

$$Y_{ic} = \alpha + \beta_1 T_{ic} + \beta_2 D_{ic} + \beta_3 T_{ic} D_{ic} + \gamma_c + \delta \tilde{Y}_{ic} + \varepsilon_{ic} \quad (2)$$

Y_{ic} is the outcome of interest (e.g., dismissals of temporary workers in the last quarter of the mayor's mandate) for municipality i in the electoral cycle c. Since the outcomes are count variables with skewed distributions, I add one and take the natural log, such that effects can be interpreted as percentage changes. T_{ic} is the treatment indicator. D_{ic} is the forcing variable. γ_c is an electoral cycle fixed effect and $\tilde{Y}_{ic}$ is a measure of the outcome in the quarter before the election, which I include for efficiency (Calonico et al., 2019). ε_{ic} is the error term. If potential outcomes are continuous around the threshold, β_1 in Equation 2 identifies the LATE. For inference I use the robust bias-corrected procedure (Cattaneo et al., 2019). To choose the optimal bandwidth I use the algorithm proposed by Calonico et al. (2020), and then show the sensitivity of the results to many alternative bandwidths.

4.3 Data

I leverage administrative data on elections, public employment, and healthcare service delivery in Brazilian municipalities. While previous studies generally examine yearly variation in employment (and in some cases development outcomes), I focus on quarterly variation to identify turnover dynamics under both the lame-duck and the incoming governments.

To measure the performance of incumbents and their challengers I use candidate-level data from Brazil's Supreme Electoral Court (TSE, *Tribunal Supremo Eleitoral*) for the four election cycles between 2004 and 2016. This data has unique identifiers for mayors, which allows me to observe whether they run for re-election and how they perform.

To measure the effects of election results on the turnover of public employees I leverage the Ministry of the Economy's Annual Social Information Report (RAIS, *Relação Anual de Informações Sociais*) between 2004 and 2017. Formal employers –including municipal governments– are legally obliged to report all their contracts to the Ministry of the Economy every year.[22] RAIS there-

[22]Entities failing to comply with the obligation to report employment data to RAIS or reporting inaccurate data are subject to fines. Moreover, employers have a direct incentive to comply since employees who do not appear in RAIS are not eligible for PIS-PASEP, a well-known and constitutionally-enshrined program that complements the wages of formal workers who make less than twice the minimum wage. In 2017, about half of municipal labor contracts were below that threshold. Accordingly, the immense majority of

fore covers the universe of municipal employees. We can observe the dates of start and end of all contracts, the contract's type, the salary, the reason for its termination, and the job's professional category, among other variables. Using RAIS, I generate counts of dismissals, hires, and resignations, by type of contract, for each municipality in each quarter around elections.[23]

To measure the effects on public service delivery I use data from the Ministry of Health's Basic Healthcare Information System (SIAB, *Sistema de Informação da Atenção Básica*). The data are collected by municipal secretariats of healthcare, consolidated by state governments, and published by the federal government at the municipality-month level from 2004 to 2015.[24] I use SIAB to generate counts of a number of healthcare services for each municipality in each quarter around elections. First, I use data on the number of home visits done by community health agents, nurses, and doctors, who are the main healthcare professionals in Brazilian municipalities. Home visits are an important component of Brazil's primary healthcare system; they help provide care to people with reduced mobility (including people in rural areas) and complement services provided in healthcare facilities (Ministério da Saúde, 2012b). Second, I use data on the number of prenatal care check-ups, medical consultations with infants (less than 1 year old), and medical consultations with small children (between 1 and 5 years old). Prenatal and child healthcare are frequently seen as central to lifelong health (Forrest and Riley, 2004) and used as proxies for the quality of healthcare systems.[25] Another advantage of examining prenatal and child care is that they are prescribed rather than elective, so they are less subject to variation in citizen demand. For example, Brazil's Ministry of Health recommends at least 6 prenatal check-ups (Ministério da Saúde, 2012a) and at least 7 medical consultations for children in their first year of life (Ministério da Saúde, 2012c).

5 Results

Regression discontinuity results demonstrate that, in Brazilian municipalities, an electoral defeat of the incumbent causes significant increases in the firing of temporary workers and the hiring of civil servants, as well as declines in the delivery of healthcare services, in the months before the election

municipal governments comply with RAIS. Additional details of the dataset are reported in Appendix C.

[23] I count as dismissals only contract terminations initiated by the employer (*exonerações a iniciativa do empregador*), and as resignations only terminations initiated by the employee (*exonerações a pedido*).

[24] The 2016 election cycle is thus excluded from these analyses.

[25] For example, the United Nations' Millenium Development Goals included the reduction of child mortality and the improvement of maternal health as two among eight major development goals.

winner takes office. These results highlight the importance of lame-ducks' political strategies and how bureaucrats' effort reacts to a changing political environment.

5.1 Effects of electoral turnover on bureaucratic turnover

Figure 2 shows the effects of electoral turnover on dismissals, hires, and resignations, for temporary and civil service employees. Regression tables, with and without covariate adjustment, and discontinuity plots are included in Appendices G, H and I, respectively.[26] Results are also robust to a broad spectrum of bandwidths (Appendix K). Placebo tests moving the discontinuity threshold generally return insignificant results (Appendix L). These effects are not just driven by the turnover of employees working directly for local politicians, such as managers, advisors, or assistants. The same effects can be observed if we exclude managerial jobs (Appendix M), or if we examine only frontline providers in the healthcare or in the education sectors such as doctors, nurses, or teachers (Appendices N and O).

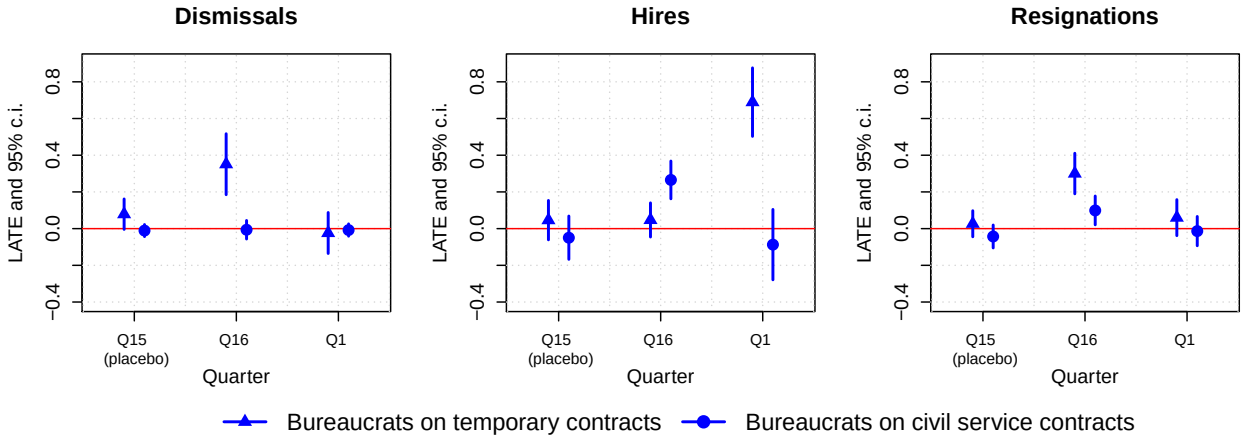
Each panel in Figure 2 shows three sets of results. On the left, the effect of an electoral defeat of the incumbent on a given outcome during the three months before the election (July through September, or the fifteenth quarter of a mayor's mandate). Reassuringly, all these placebo tests return statistically insignificant effects. In the center, each panel reports the effect of an electoral defeat of the incumbent on bureaucratic turnover during the three months between the election and the date winners are sworn in (October through December, or the sixteenth and last quarter of the incumbent's mandate). On the right, each panel shows the effects of the mayor losing the election on outcomes in the first quarter of the winner's mandate (January through March).

In line with Hypothesis 1, an electoral defeat of the incumbent leads to a large and statistically significant increase in the dismissal of temporary workers, as shown in the left-hand panel of Figure 2. Incumbents who lose the election increase dismissals of temporaries by 42% in the last three months of their mandate,[27] when compared to incumbents who win the reelection ($p < 0.001$). For reference, there are on average 26.2 dismissals of temporaries in the last quarter of an electoral year in municipalities where the incumbent wins. Election results do not have an effect on dismissals of

[26] Without covariate adjustment, all but two results on healthcare services remain statistically significant.

[27] Since outcomes are in the log scale, coefficients are to be interpreted as follows: the local average treatment effect of an electoral defeat of the mayor is a change in the outcome by $100 \times e^{\hat{\beta}_1} - 100\%$.

Figure 2: Effect of an electoral defeat of the incumbent on bureaucratic turnover



Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (October through December). Q1 corresponds to the first quarter of the election winner's mandate (January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

civil servants, which are uncommon because of the legal protections these bureaucrats enjoy.[28]

In-depth interviews with prosecutors and politicians suggest that dismissals of temporary workers after the defeat of the incumbent are intended to balance the accounts before handing the government over to the winner. A municipal secretary of administration (in charge of human resources) in the northeastern state of Rio Grande do Norte said the following, when asked about the transition period before their mandate: "There were cuts in personnel to hand the accounts cleaner, with resources in the account. Expenses were cut to hand over a more balanced city hall. [...] If there is no political turnover expenses do not drop."[29] Horizontal accountability actors also point to this phenomenon. When asked about the decisions taken by lame-duck governments, a prosecutor in Rio Grande do Norte said: "When a mayor loses the election, they try to save money and they try not to hand out the accounts in a bad state. [...] Once the mayor is out of office they are not able to afford equally good lawyers, and they know that [legal problems] can arrive later."[30] Consistent with this interpretation, an electoral defeat of the incumbent causes a larger increase in

[28]In the average municipality where the incumbent wins, 0.53 civil servants are dismissed in the last three months of an electoral year.

[29]Municipal secretary of administration interviewed in the state of Rio Grande do Norte in June 2018.

[30]State prosecutor interviewed in the state of Rio Grande do Norte in June 2018.

dismissals among high-pay bureaucrats than among low-pay bureaucrats, although the difference is not statistically significant (Appendix P).

Brazilian media provide additional qualitative evidence on the effect of election results on the dismissal of temporary workers. News reports about two municipalities in the central state of Tocantins are illustrative. The local government of Porto Nacional was reported to dismiss large numbers of employees immediately after an electoral defeat. The mayor argued this was necessary to adjust public expenses before leaving office (G1, 2016b). In Miracema, about 150 municipal employees were reportedly dismissed by the mayor after she lost the reelection, alleging the municipality was going through financial hardship (G1, 2016a). Media reports about this phenomenon are common in other states as well. For example, dismissals were reported following an electoral defeat of the mayor in multiple municipalities in the northern state of Amazonas (A Crítica, 2016) and in the southern state of Rio Grande do Sul (G1, 2012). A recurrent theme in all these reports is the negative impact of dismissals on the delivery of education and healthcare services.

Results in the central panel of Figure 2 show that hiring of civil servants increases as a result of the incumbent losing the election, in agreement with Hypothesis 2. On average, municipalities where the incumbent loses see an increase of 30.3% in the hiring of civil servants, when compared to municipalities without electoral turnover ($p < 0.001$). For reference, 3.6 civil servants are hired in the typical municipality with no electoral turnover in the last quarter of an electoral year.

Interviews suggests that these increases respond to a strategy of hiring civil service employees in order to decrease the opponent's leeway for hiring their own supporters upon taking office, and thus facilitate their return to power. Another secretary of administration in the state of Rio Grande do Norte illustrated this with a report about the preceding government: "The previous mayor hired many people [who had previously passed the civil service exam], especially after they lost the election, to make things harder for the new administration."[31] The fact that about half of the mayors who narrowly lost their reelection in 2008 or 2012 ran again four years later helps understand why election losers in this context would seek to make things harder for the incoming government.[32] The hiring of civil servants to constrain the opponent is not unique to Brazil. A qualitative study of the Dominican Republic for example notes that incumbent politicians there

[31]Municipal secretary of administration interviewed in the state of Rio Grande do Norte in June 2018.

[32]50.75% (49.2%) of the mayors who lost their reelection in 2008 (2012) by less than 10 points ran again four years later (TSE data).

gave tenure to bureaucrats as a form of "insurance against an opposition party successor," since "tenure would reduce the number of public sector jobs [... an] opposition party President could exchange for political support" (Schuster, 2020, 36).

This use of civil service hiring by lame-ducks can hurt their opponents because, indeed, they use their discretion to hire as soon as they get into office. Hires of temporaries increase on average by 99.2% in the first quarter of a post-electoral year in municipalities where there is a new mayor, when compared to municipalities where the incumbent is reelected ($p < 0.001$). Municipalities without turnover hire on average 105.7 bureaucrats in the first quarter of the post-election year. These results are in line with previous research showing that in Brazil election winners use bureaucratic appointments to reward their supporters (Colonnelli et al., 2020; Barbosa and Ferreira, 2019). Similarly to other horizontal accountability actors I interviewed, a prosecutor in the northeastern state of Ceará said that temporary contracts are often used as "political currency."[33]

An alternative explanation for the hiring of civil servants by lame-ducks might be that they seek to to protect their policy legacy before leaving office, an argument that has been made for a similar phenomenon in US case (Lewis, 2008; Mendelson, 2003). To test this possibility, I examine how this effect differs when the incumbent belongs to a large programmatic party and thus can be expected to have stronger policy concerns. Results reported in Appendix Q show that in those cases an electoral defeat of the incumbent does not cause an increase in the hiring of civil servants in the last quarter of the election year. This, together with the interviews, suggests that these hires are driven by a strategy to constrain opponents in fiscal rather than policy terms.

This finding goes against the common view of civil service hiring as politically neutral. Whereas civil service systems dramatically reduce (or eliminate) politicians' discretion on *who* to hire, they often do not eliminate their discretion on *how many* people to hire or *when* to do so. The quantity and timing of hires are important dimensions of human resources management in any organization, and these results suggest that politicians can make strategic use of them for political gain.

Electoral turnover also causes resignations of municipal employees immediately after the election, as shown in the right-hand panel of Figure 2. While researchers have often noted on the difficulty of differentiating voluntary from involuntary bureaucrat turnover (Hong and Kim, 2019; Dahlström and Holmgren, 2019; Grissom et al., 2016), the RAIS dataset allows us to neatly separate the two. On average, an electoral defeat of the incumbent causes an increase of 35% in resigna-

[33]State prosecutor interviewed in the state of Ceará in August of 2017.

tions among temporary employees ($p < 0.001$) and 10.4% among civil servants ($p < 0.05$) in the quarter following the election. For reference, in localities where the incumbent wins the reelection we observe, on average, 6.3 resignations of temporaries and 3.2 resignations of civil servants in that period.

This increase in resignations could be due to strategic exit by bureaucrats who anticipate conflicts with the incoming government (Bolton et al., 2020; Doherty et al., 2019a,b). Consistent with this interpretation, resignations by high-pay employees appear to increase more after an electoral defeat than resignations among low-pay bureaucrats, although the difference is not statistically significant (Appendix P). Resignations could also ensue if bureaucrats simply dislike the post-election environment of policy and organizational switches. In any case, a key implication of the effect of election results on resignations is that incumbent bureaucrats are not passive subjects of the political strategies of election losers. Instead, they sometimes actively respond to this changing political environment, thereby shaping the bureaucratic politics of transition periods.

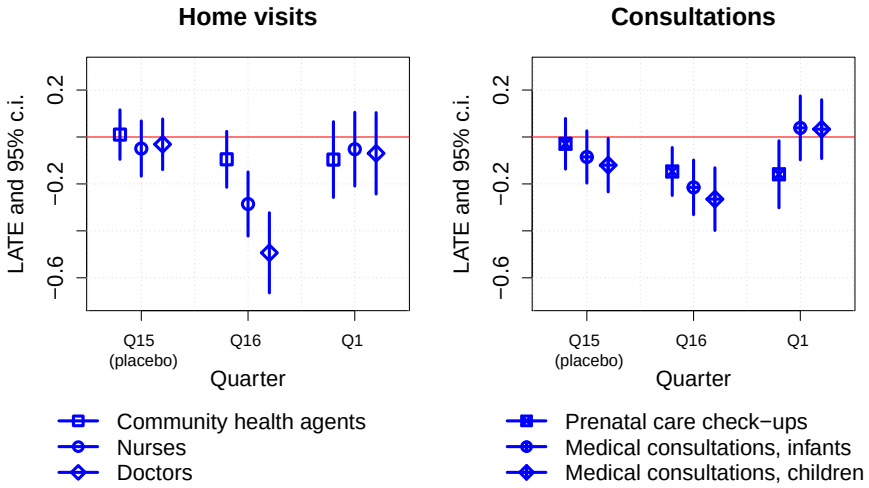
5.2 Effects of electoral turnover on public service delivery

Results in Figure 3 demonstrate that, in line with Hypothesis 3, electoral turnover has large, negative effects on the delivery of healthcare services during the transition period.[34] An electoral defeat of the incumbent causes declines in home visits of healthcare professionals, as shown in the left-hand panel. Visits by nurses and by doctors decline by 24.9% and 39%, respectively, as a result of the mayor losing the reelection ($p < 0.001$). The decline in home visits by community health agents is not statistically significant. For reference, municipalities with no electoral turnover deliver on average 416.9 home visits by nurses and 217.1 home visits by doctors in the last quarter of the election year. These declines are not compensated by increases in the first quarter of the new administration.

Electoral turnover also causes declines of maternal and child healthcare services, as shown in the right-hand panel of Figure 3. Prenatal care check-ups go down by 13.7% in the last quarter of the mayor's mandate as a result of their electoral defeat ($p < 0.01$). This effect persists into the first quarter of the new administration, where we observe 14.7% less prenatal care check-ups than in municipalities where the mayor wins the election ($p < 0.05$). Municipalities with no

[34] Placebo tests using healthcare services in the quarter before the election return null effects, with the exception of the one for medical consultations with children, which has a p-value of 0.04.

Figure 3: Effect of an electoral defeat of the incumbent on the delivery of healthcare services



See notes under Figure 2.

turnover perform on average 392.9 and 415.3 prenatal care check-ups in the two quarters following elections, respectively. Medical consultations with both infants and children also decline as a result of the mayor losing the election, by 19.3% and 23.3% percent respectively ($p < 0.001$). A typical municipality where the incumbent is reelected delivers 168.3 and 329.3 medical consultations with infants and with children during the last quarter of an electoral year. Like with home visits, these declines are not compensated by increases in service delivery when the election winner takes office.

These declines in pubic service delivery may be driven by a variety of factors, including dismissals, disruptions to other inputs like transportation, and changes in bureaucrats' level of effort. The logic of these multiple mechanisms connecting electoral turnover to public service delivery was well illustrated by a municipal secretary of healthcare in the northeastern state of Ceará: "A change in government stops everything, because of the transition... The population suffers as a result. For example, we were a reference municipality in the fight against dengue, but because of that transition dengue cases have increased by over 500%. Pregnant women who used to do prenatal check-ups regularly stopped, which led to fetal deaths, infant deaths, etc. [...] Workers stop working. Those who are in temporary contracts are dismissed, and contracts for example for transportation are canceled. The outgoing mayor does not want to have any more expenses. [...] Tenured professionals stay but with no conditions to do their job, with no materials."[35]

[35]Municipal secretary of healthcare interviewed in the state of Ceará in August of 2017.

We can take advantage of variation in the data to gauge the plausibility of each of these potential mechanisms. A first possibility is that disruptions to transportation contracts drive these effects. While declines in transportation may help explain why effects are more pronounced for home visits than for consultations, they cannot explain the large and significant declines for the latter, which take place in the clinics and for which healthcare personnel need no transportation. Moreover, there is no significant heterogeneity between geographically smaller and larger municipalities (Appendix R). Disruptions in transportation are thus unlikely to explain the results in Figure 3.

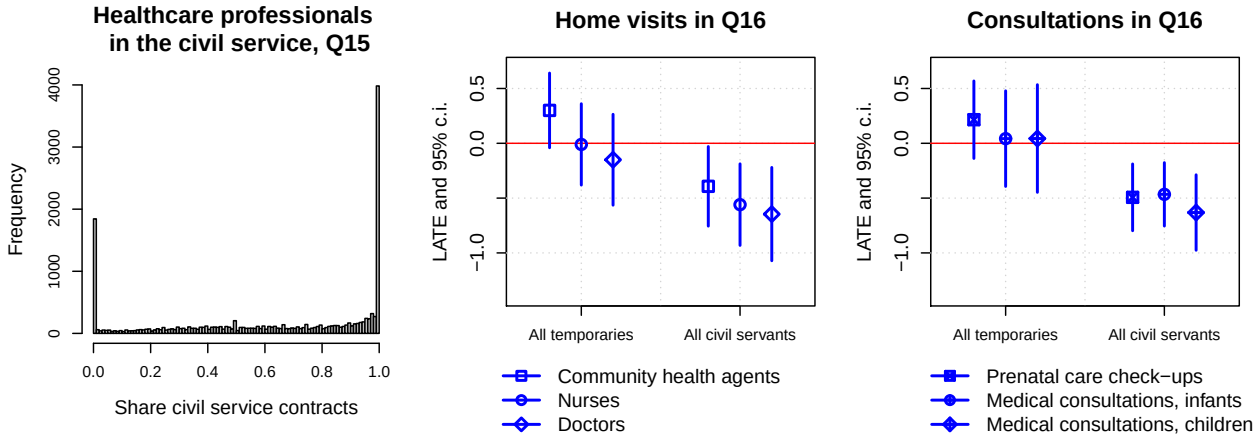
A second possibility suggested by the interview quote above is that declines in service delivery are driven by the dynamics of bureaucratic turnover. This is plausible, given that electoral turnover does cause an increase in the dismissal of healthcare bureaucrats in the months following the election (Appendix N), and the turnover of teachers has been associated to declines in student test scores (Akhtari et al., 2020; Fagernäs and Pelkonen, 2020; Ronfeldt et al., 2013). To test whether bureaucratic turnover is the main mechanism driving the results in Figure 3, I examine the effect of electoral turnover in municipalities where either all or none of the healthcare workers in the quarter before the election have civil service contracts.[36] This comparison gives us variation in municipalities' vulnerability to bureaucrat turnover in the healthcare sector while avoiding conditioning on post-treatment variables, which would introduce bias.

The results, shown in Figure 4, suggest that bureaucratic turnover is not the main mechanism connecting an electoral defeat of the incumbent and the declines in public service delivery. Municipalities where all healthcare workers have civil service contracts (and thus are protected from dismissal) experience significant, negative effects of electoral turnover on service delivery. On the other hand, municipalities where all healthcare workers have temporary contracts do not experience significant disruptions in the delivery of healthcare. Results in Figure 4 imply that there must be a mechanism other than bureaucratic turnover at play. More generally, these results suggest that insulating bureaucrats through civil service protections does not necessarily eliminate the connection between an electoral defeat of the incumbent and declines in service delivery, at least in this context.

A final possibility is that the effects on service delivery are not driven by variations in inputs (e.g., human resources, transportation) but rather by declines in bureaucratic accountability. At least in developing contexts, bureaucratic effort and public service delivery respond to monitoring and accountability pressures from politicians (Raffler, 2020; Dasgupta and Kapur, 2020; Gulzar and

[36] See Appendix S for a characterization of these municipalities.

Figure 4: Effect of an electoral defeat of the incumbent on the delivery of healthcare services, in municipalities where specialized healthcare workers in the payroll before the election are all civil servants or all temporaries



See notes under Figure 2.

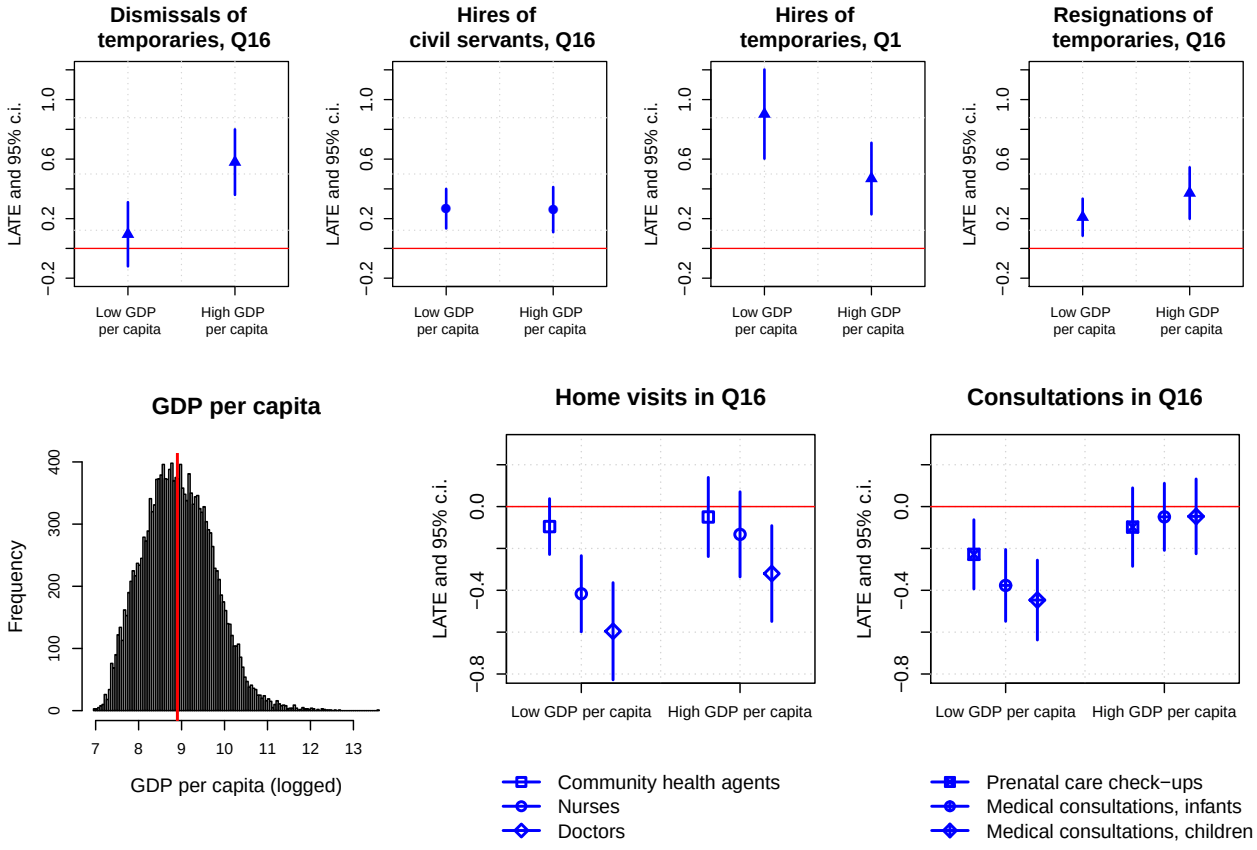
Pasquale, 2017). Yet, lame-duck politicians and senior officials are likely less able and/or willing to monitor and exert pressure over bureaucrats in their last months in office. The observed effects of electoral turnover on service delivery may thus be driven largely by this worsening of bureaucratic accountability before the winner takes office. Another municipal secretary of healthcare in the state of Ceará saw this as the main problem in transition periods. When asked about how electoral turnover impacts bureaucratic effort, they said that "tenured bureaucrats close their arms, because no one is holding them to account. [...] Temporaries do not work because they know their days [in the job] are counted."[37]

Two additional pieces of evidence support this interpretation of the results in Figure 3. First, the results generally disappear when election winners take office. Whereas disruptions to teams continue during the first months of the new administration (with new hires and organizational changes), the weakened accountability dynamics only last while the election loser remains in office. Second, as shown in Figure 5, wealthier municipalities experience comparable or larger effects on bureaucratic turnover after the election but smaller and often statistically insignificant declines in healthcare service delivery. This again suggests that bureaucratic turnover is not the main mechanism, and that more developed localities have mechanisms that can compensate for the deleterious effects of electoral turnover on healthcare delivery, such as stronger bureaucratic norms

[37]Municipal secretary of healthcare interviewed in the state of Ceará in August 2017.

or more robust social accountability.[38]

Figure 5: Effect of an electoral defeat of the incumbent on bureaucratic turnover and healthcare service delivery, by whether the municipality has GDP per capita below or above the median



See notes under Figure 2.

Together, these results suggest that the declines in healthcare services caused by an electoral defeat of the incumbent are not merely driven by bureaucratic turnover, as recent research on teachers in Brazil and India suggests (Akhtari et al., 2020; Fagernäs and Pelkonen, 2020). Instead, it seems a worsening of bureaucratic accountability during the transition period plays an important role in the connection between electoral turnover and service delivery. While consistent with previous research on the relationship between top-down accountability and bureaucratic effort in developing settings, these results are suggestive rather than conclusive. Future research might seek to find more conclusive evidence on the causal mechanism driving the results in Figure 3.

[38]On the other hand, there is no noticeable heterogeneity by municipality population or by whether the incumbent administration is exposed to a random anti-corruption audit (see Appendices T and U).

6 Conclusion

Political turnover is central to the theory and practice of representative democracy. This article argues that, despite its many benefits, political turnover also has costs, at least in the short term, as it leads to bureaucratic turnover and depresses public service delivery. Whereas previous studies of turnover emphasize the actions of election winners, this article advances a theory centered on the political strategies of lame-duck governments and their impacts on both the composition and the performance of the bureaucracy. I demonstrate these turnover dynamics using a close-races regression discontinuity design and administrative data on public employment and healthcare service delivery in Brazilian municipalities.

To summarize, results show that an electoral defeat of the incumbent causes dismissals of temporary employees as well as hires of civil servants before the winner takes office. Evidence suggests these effects are driven by lame-ducks seeking to improve their compliance with legal rules about temporary hiring before leaving office, on the one hand, and to constrain their opponent's fiscal capacity to hire their own supporters, on the other. At the same time, the delivery of major healthcare services declines in the months immediately following the election. While bureaucratic turnover may contribute to the downturn of service delivery, the evidence suggests these declines are driven by a worsening of bureaucratic accountability under lame-duck government, since election losers are likely less able and/or willing to monitor and motivate bureaucrats to perform.

These findings have important implications for how we think about political turnover and lame-duck governments. While previous studies on the connections between political and bureaucratic turnover typically examine yearly variation in outcomes, political turnover is best seen as a process starting when the uncertainty characteristic of competitive elections turns into the certainty of the incumbent's defeat and the ensuing transition of power. Despite formal and informal rules limiting what lame-ducks can do, in practice these governments use their remaining time in office to exercise their discretion over the bureaucracy in unequivocally political strategies. Bureaucrats also behave strategically during the transition period, either by resigning or by changing their level of effort.

A second key implication of this study is that the fear of being prosecuted after leaving office can have powerful impacts over the behavior of lame-duck politicians during their remaining time in office. This suggests that there is an incumbency advantage in the control of information about government irregularities, even in contexts with strong anti-corruption institutions, and that the prospect of losing that advantage can lead to disruptive decisions in the months before the election

winner takes office.

A third important implication of the results is that neither public employment in the civil service nor the performance of civil servants are as insulated from political influence as is typically assumed. Whereas the targeting of civil service jobs is generally protected from political influence through competitive examinations, politicians often retain discretion over the scale and the timing of civil service hiring. Lame-ducks can mobilize this discretion strategically by hiring civil servants before leaving office and thus reduce their opponents' fiscal capacity to hire their own supporters once in office. This perspective calls for extending the comparative research on civil service reform to study when and why politicians expand the scope of the civil service once legal reforms are passed.

Finally, the findings in this article suggest that the dynamics of political turnover can hurt citizen welfare. If political turnover depresses service delivery in a policy area that is both salient to voters and consequential for human development, it is plausible that it disrupts many other areas of government activity. From a policy standpoint, this study suggests that shortening the transition period between the date of the election and the date winners take office can enhance citizen welfare. While there may be good administrative reasons to allow a few days or weeks between the two dates, longer transition periods may carry significant costs in terms of bureaucratic turnover and standstill.

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Appendices

A Transition periods in a sample of democracies

Table A.1: Recent transition periods in a sample of 20 democracies

Country	Year	Election held	Winner took office	Transition length	Winner
United Kingdom	2010	5/6/10	5/11/10	5 days	Cameron
France	2017	5/7/17	5/14/17	7 days	Macron
Japan	2012	12/16/12	12/26/12	10 days	Abe
India	2014	5/12/14	5/26/14	14 days	Modi
Canada	2015	10/19/15	11/4/15	16 days	Trudeau
Bolivia	2020	10/18/20	11/8/20	21 days	Arce
Spain	2011	11/20/11	12/21/11	31 days	Rajoy
New Zealand	2017	9/23/17	10/26/17	33 days	Ardern
Kenya	2013	3/4/13	4/9/13	36 days	Kenyatta
Argentina	2019	10/27/19	12/10/19	44 days	Fernández
Colombia	2018	6/17/18	8/7/18	51 days	Duque
Philippines	2016	5/9/16	6/30/16	52 days	Duterte
Peru	2016	6/5/16	7/28/16	53 days	Kuczynski
Nigeria	2015	3/29/15	5/29/15	61 days	Buhari
Brazil	2018	10/28/18	1/1/19	65 days	Bolsonaro
Germany	2005	9/18/05	11/22/05	65 days	Merkel
United States	2020	11/3/20	1/20/21	78 days	Biden
Chile	2017	12/17/17	3/11/18	84 days	Piñera
Indonesia	2014	7/9/14	10/20/14	103 days	Widodo
Mexico	2018	7/1/18	12/1/18	153 days	López Obrador

Data consider the latest instance in which a new party got to executive office at the national level through popular election. The date for the 2014 elections in India corresponds to the last day of voting. The dates for the elections in Brazil, Peru and Colombia correspond to the second round of presidential elections.

B In-depth interviews

In-depth interviews with local actors gave origin to the hypotheses tested in this article, but were part of a larger empirical study of patronage in Brazil. Over 18 months of fieldwork done between January of 2016 and June of 2019 I conduced 121 in-depth, semi-structured interviews with municipal bureaucrats and politicians, and with state-level horizontal accountability actors (like auditors and prosecutors).[39] I conducted these interviews in Portuguese, face-to-face, at the office of the interviewee, and with no audio recording device. I chose not to record interviews because some of the topics discussed were highly sensitive, including corrupt and illegal uses of public employment. While recording interviews would have allowed for more complete transcripts, it would have seriously hindered the reliability of the data and subjects' willingness to participate. Some subjects agreed to participate on the condition of anonymity or confidentiality. When quoting interviewees, I specify only their position, the state, and the month of the interview in order to safeguard their identity. In total, I interviewed 51 municipal politicians, 54 municipal bureaucrats, and 16 horizontal accountability actors.[40] Interviews were done in 45 municipalities in 7 states across 3 different regions of Brazil.[41] Interview locations were chosen to ensure variation in the political and socioeconomic contexts of fieldwork.

Within each municipality, fieldwork focused on the center, where government offices are. I approached potential interviewees at their offices and requested an interview after introducing myself and the research project. No compensation of any sort was offered or given to participants. Most subjects that I managed to speak to directly agreed to participate.[42] Interviews were semi-structured, and usually started as an open conversation about the interviewee's background, the challenges they faced in their position, and their perception of public services in the municipality. As the conversation advanced, I followed up with questions about the local dynamics of public employment, including in some cases specific questions about the connection between political turnover, bureaucratic turnover, and public service delivery. I took handwritten notes during and after the interviews. The median duration of interviews was one hour.

[39] In-depth interviews were approved by MIT's Committee on the Use of Humans as Experimental Subjects under protocols 170593389 and 1806407144.

[40] 41 of of the 51 politicians were secretaries. 46 of the 54 bureaucrats were school directors, clinic managers, and social assistance center coordinators. Of the 16 horizontal accountability actors, 8 were state prosecutors or prosecutorial staff.

[41] Interviews were done in the states of Ceará (43 interviews), Rio Grande do Norte (21), Paraíba (15), Rio de Janeiro (19), Minas Geráis (10) São Paulo (1), and Goiás (12).

[42] Some refused, mostly arguing they did not have time. Two refused due to the research topic.

C Administrative labor market data

I leverage the anonymized RAIS, made available by Brazil's Ministry of the Economy. In it, I identify municipal employees using the legal nature of the employer and the municipality.[43] Descriptive statistics for the data on municipal employees are reported in Table C.2. Between 2005 and 2017 the number of municipal government contracts has increased by 2.5 million or 60%, but the share of civil service employees has remained roughly constant at about two thirds.[44] I code as civil service contracts those in the *regime jurídico único de servidores públicos*, and as temporary all other employees, who are hired through a variety of legal regimes. *Unfortunately RAIS does not allow a reliable identification of temporary workers who are politically appointed (e.g., cargo comissionado, função de confiança).*

Table C.2: Descriptive statistics for municipal employees as identified in RAIS, for election and post-election years between 2004 and 2017

	Number of municipalities	% of total	Millions of contracts	Share civil service
2017	5522	99.16	6.60	0.67
2016	5480	98.40	6.42	0.67
2013	5499	98.74	6.50	0.64
2012	5513	99.08	6.09	0.65
2009	5497	98.80	5.61	0.64
2008	5481	98.51	5.33	0.65
2005	5459	98.13	4.41	0.66
2004	5387	96.91	4.06	0.69

Municipal governments (like all formal employers) are legally required[45] to report data for all its employees[46] to the Ministry of the Economy through the RAIS system. Yet, a minority of them (between 0.84 and 3.09% in the years I use) do not show up in the data. Technical staff at the

[43] I consider only employees hired by municipal executive governments and their foundations and other dependent entities.

[44] This share is the same in the data about municipal employees collected through government surveys by the Brazilian Institute of Geography and Statistics (IBGE, *Instituto Brasileiro de Geografia e Estatística*).

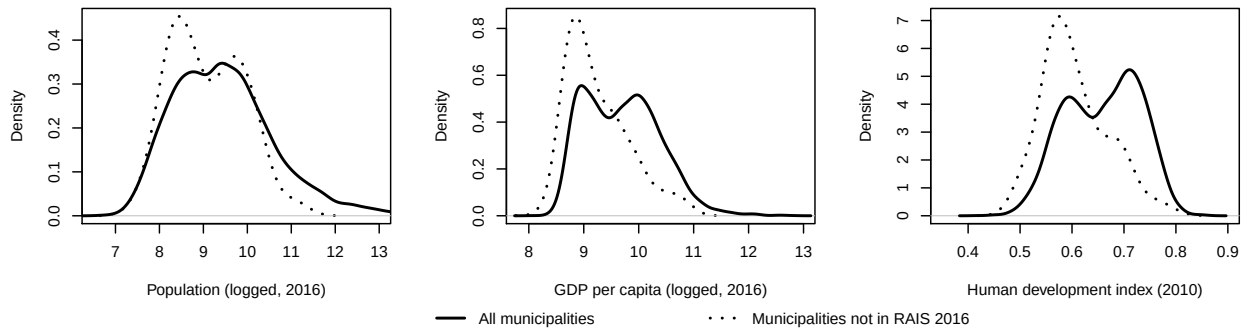
[45] Entities failing to comply with the obligation to report employment data to RAIS or reporting inaccurate data are subject to fines. Moreover, employers have a direct incentive to comply since employees who do not appear in RAIS are not eligible for PIS-PASEP, a well-known and constitutionally-enshrined program that complements the wages of formal workers who make less than twice the minimum wage. In 2017, about half of municipal government labor contracts were below that threshold.

[46] Elected officials, interns, and very transitory workers (*eventuais*) are not considered employees for the purposes of RAIS.

Ministry confirmed that some municipalities fail to report employment data to RAIS, and associated it to capacity issues and/or corruption.

To understand the kind of municipalities that are not reporting employment data to RAIS, I examine the 89 municipalities that do not show up in the data in 2016,[47] and compare them to all 5,569 municipalities.[48] As can be seen in Figure C.1, municipalities failing to report employment data tend to be smaller, poorer, and less developed. This is consistent with both capacity and corruption mechanisms driving attrition. To the extent that municipal development correlates with the political use of public employment (Colonnelli et al., 2020; Barbosa and Ferreira, 2019), their exclusion from the data is biasing the results. This bias, however, is likely to be in the direction of attenuating results (i.e. bringing them closer to zero). In any case, results are not representative of the overall population of municipalities, but rather of those complying with the RAIS reporting requirement.

Figure C.1: Socioeconomic characteristics of municipalities not reporting employment data in 2016



[47] Results are similar when analyzing the municipalities not reporting data in 2004.
[48] I exclude Brasília because it does not have a municipal government.

D Raw outcome means, by whether the mayor wins the reelection

Mean of employment and healthcare outcomes, by whether the incumbent wins or loses the reelection, regardless of their vote margin.

Figure D.2: Outcome means on bureaucratic turnover, by whether the mayor wins the reelection

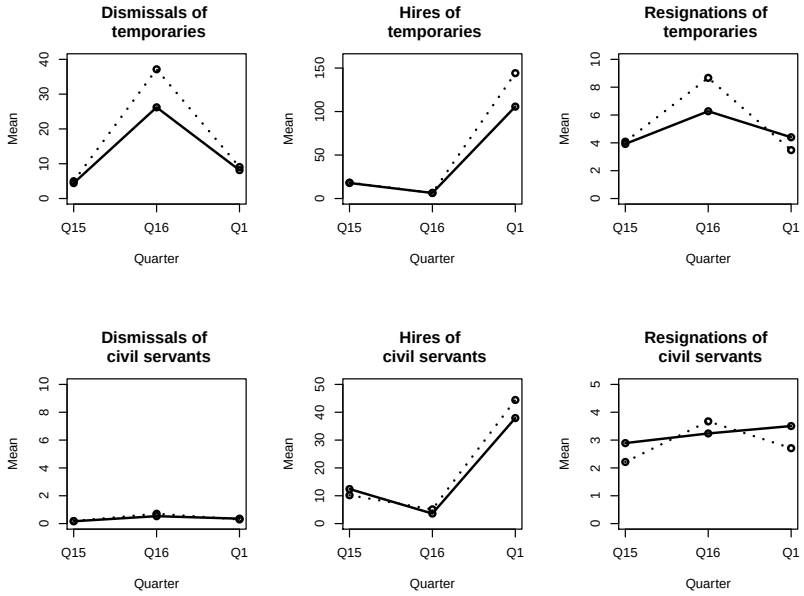
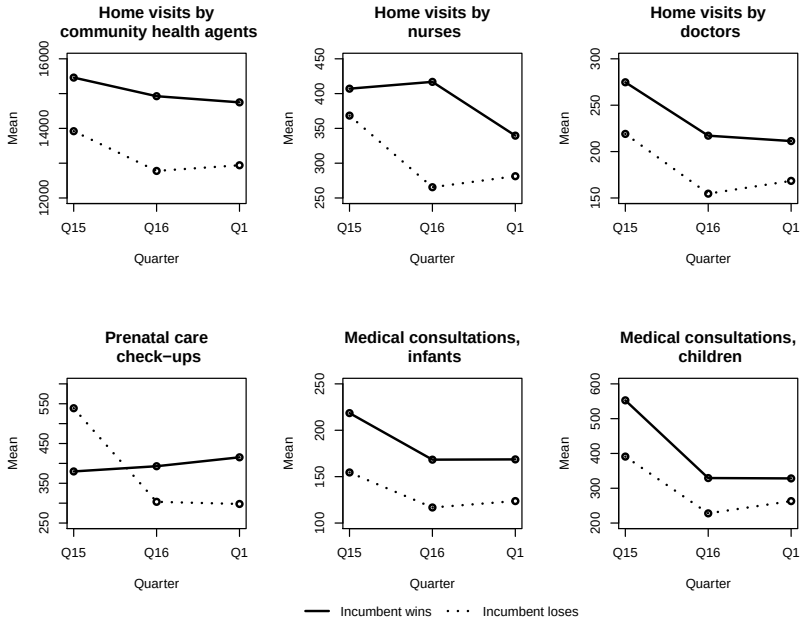


Figure D.3: Outcome means on healthcare service delivery, by whether the mayor wins the reelection



E Continuity of the forcing variable

Figure E.4: Histogram of the forcing variable

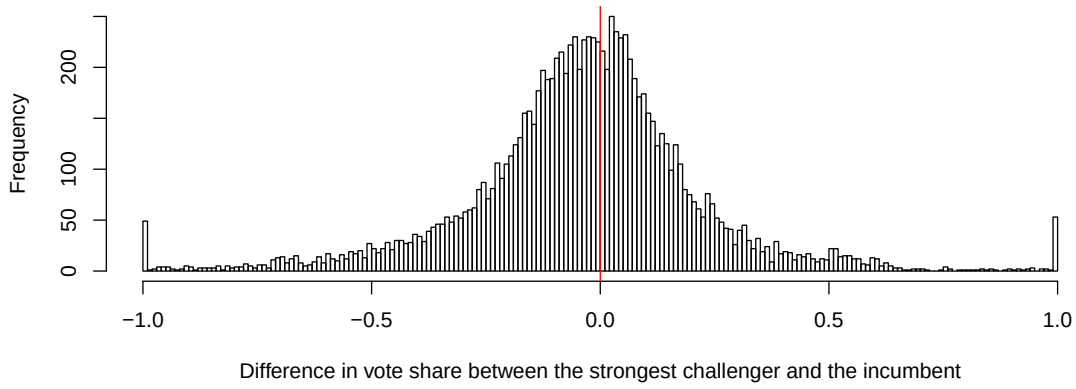
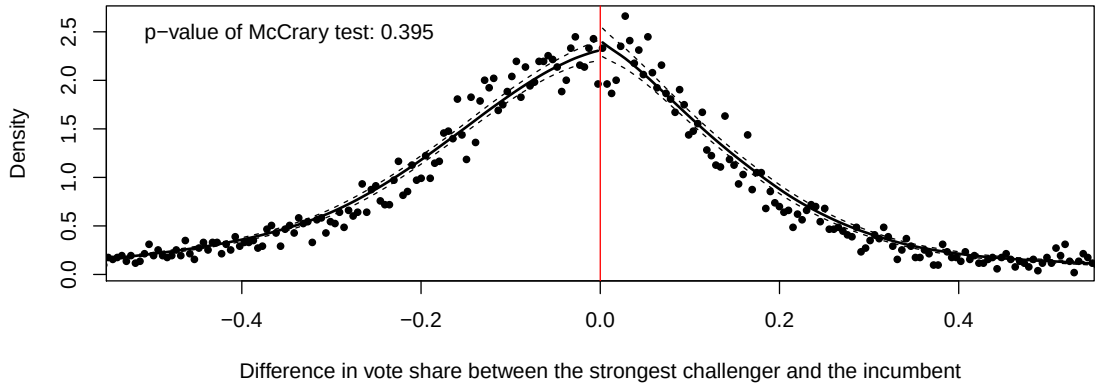


Figure E.5: Density of the forcing variable and McCrary (2008) discontinuity test



F Continuity of pre-treatment covariates

To chek whether pre-treatment covariates are continuous around the threshold, I use them as dependent variables in the main model.

Table F.3: Effect an electoral defeat of the incumbent on pre-treatment covariates: Socioeconomics

	Population	GDP	GDP per capita	Deaths	Deaths per thousand
Incumbent defeated	0.078	0.126	0.07	0.049	-0.036
	(0.067)	(0.088)	(0.05)	(0.07)	(0.093)
Bandwidth	0.154	0.135	0.136	0.148	0.217
Observations	5952	5442	5458	5822	7291

Table F.4: Effect an electoral defeat of the incumbent on pre-treatment covariates: Bureaucracies

	Number of bureaucrats	Bureaucrats per capita	Share civil servants
Incumbent defeated	0.058	-0.001	-0.006
	(0.062)	(0.001)	(0.019)
Bandwidth	0.156	0.192	0.153
Observations	5911	6750	5827

Table F.5: Effect an electoral defeat of the incumbent on pre-treatment covariates: Elections

	Turnout	Concentration	PT	MDB	PSDB	Large	Aligned
Incumbent defeated	-0.006	0	0.002	0.019	-0.021	-0.004	0.016
	(0.008)	(0.004)	(0.018)	(0.025)	(0.021)	(0.029)	(0.02)
Bandwidth	0.135	0.165	0.166	0.146	0.168	0.186	0.179
Observations	5418	6268	6298	5777	6347	6764	6608

*p<0.05; **p<0.01; ***p<0.001. The bandwidth is determined by the algorithm of Calonico et al. (2020). Robust standard errors in parentheses. All regressions follow the specification in Equation 2; controls include election cycle fixed effects only. Measures of population (logged), GDP (logged) and GDP per capita come from IBGE and correspond to one year before the election. Measures of deaths (logged) and deaths per thousand residents are from the Ministry of Health and correspond to one year before the election. Numbers of bureaucrats (logged), bureaucrats per capita, and share of bureaucrats who are civil servants are from RAIS and correspond to the quarter before the election. Turnout is the number of valid votes divided by population. Concentration is a Herfindahl index of the concentration of votes across candidates. Incumbent party is the party the mayor ran with in the previous election, as reported by TSE. Large corresponds to a mayor who belongs to either PT, MDB, or PSDB. Aligned corresponds to a mayor who belongs to the party of Brazil's president.

G Regression tables for results shown in Figures 2 and 3

G.1 Effects of electoral turnover on bureaucratic turnover

Table G.6: Effect an electoral defeat of the incumbent on dismissals of public employees

	Temporaries			Civil servants		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.079	0.351***	-0.024	-0.011	-0.006	-0.008
	(0.042)	(0.085)	(0.057)	(0.017)	(0.026)	(0.017)
Bandwidth	0.127	0.166	0.176	0.146	0.187	0.215
Observations	5096	6191	6377	5652	6649	7079

Table G.7: Effect an electoral defeat of the incumbent on hires of public employees

	Temporaries			Civil servants		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.046	0.047	0.689***	-0.049	0.265***	-0.087
	(0.055)	(0.047)	(0.095)	(0.06)	(0.052)	(0.098)
Bandwidth	0.172	0.164	0.183	0.169	0.168	0.145
Observations	6319	6137	6519	6264	6236	5595

Table G.8: Effect an electoral defeat of the incumbent on resignations of public employees

	Temporaries			Civil servants		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.027	0.3***	0.06	-0.043	0.099*	-0.013
	(0.036)	(0.056)	(0.05)	(0.032)	(0.04)	(0.041)
Bandwidth	0.187	0.124	0.124	0.19	0.197	0.192
Observations	6649	5008	4953	6714	6852	6695

*p<0.05; **p<0.01; ***p<0.001. The bandwidth is determined by the algorithm of Calonico et al. (2020). Robust standard errors in parentheses. All regressions follow the specification in Equation 2. Dependent variables are in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

G.2 Effects of electoral turnover on public service delivery

Table G.9: Effect an electoral defeat of the incumbent on home visits by community health agents (CHAs) and by nurses

	Home visits by CHAs			Home visits by nurses		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.01	-0.095	-0.096	-0.049	-0.286***	-0.052
	(0.054)	(0.061)	(0.082)	(0.06)	(0.07)	(0.08)
Bandwidth	0.119	0.165	0.182	0.138	0.14	0.161
Observations	3664	4648	4953	4072	4130	4535

Table G.10: Effect an electoral defeat of the incumbent on home visits by doctors and prenatal care check-ups

	Home visits by doctors			Prenatal care check-ups		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	-0.031	-0.494***	-0.07	-0.029	-0.147**	-0.159*
	(0.055)	(0.087)	(0.088)	(0.055)	(0.052)	(0.073)
Bandwidth	0.213	0.106	0.152	0.167	0.22	0.158
Observations	5338	3320	4357	4660	5424	4461

Table G.11: Effect an electoral defeat of the incumbent on medical consultations

	Consultations with infants			Consultations with children		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	-0.085	-0.215***	0.039	-0.12*	-0.265***	0.033
	(0.057)	(0.059)	(0.069)	(0.058)	(0.068)	(0.064)
Bandwidth	0.148	0.168	0.16	0.145	0.139	0.197
Observations	4284	4681	4494	4209	4094	5146

*p<0.05; **p<0.01; ***p<0.001. The bandwidth is determined by the algorithm of Calonico et al. (2020). Robust standard errors in parentheses. All regressions follow the specification in Equation 2. Dependent variables are in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

H Regression tables omitting controls

H.1 Effects of electoral turnover on bureaucratic turnover, omitting controls

Table H.12: Effect an electoral defeat of the incumbent on dismissals of public employees

	Temporaries			Civil servants		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.112	0.487***	0.04	-0.008	-0.006	-0.006
	(0.063)	(0.117)	(0.07)	(0.018)	(0.026)	(0.019)
Bandwidth	0.137	0.145	0.161	0.148	0.197	0.176
Observations	5405	5625	6063	5723	6857	6456

Table H.13: Effect an electoral defeat of the incumbent on hires of public employees

	Temporaries			Civil servants		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.039	0.068	0.733***	-0.073	0.236***	-0.096
	(0.094)	(0.073)	(0.122)	(0.08)	(0.062)	(0.104)
Bandwidth	0.144	0.139	0.16	0.167	0.172	0.158
Observations	5612	5461	6024	6223	6331	5991

Table H.14: Effect an electoral defeat of the incumbent on resignations of public employees

	Temporaries			Civil servants		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.076	0.352***	0.09	0	0.11*	0.012
	(0.064)	(0.075)	(0.064)	(0.049)	(0.051)	(0.057)
Bandwidth	0.142	0.128	0.127	0.171	0.178	0.137
Observations	5537	5131	5111	6315	6478	5414

*p<0.05; **p<0.01; ***p<0.001. The bandwidth is determined by the algorithm of Calonico et al. (2020). Robust standard errors in parentheses. All regressions follow the specification in Equation 2 but omit controls. Dependent variables are in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

H.2 Effects of electoral turnover on public service delivery

Table H.15: Effect of an electoral defeat of the incumbent on home visits by community health agents (CHAs) and by nurses

	Home visits by CHAs			Home visits by nurses		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.035	-0.094	-0.107	0.062	-0.248*	-0.03
	(0.137)	(0.132)	(0.129)	(0.125)	(0.107)	(0.115)
Bandwidth	0.146	0.176	0.196	0.146	0.223	0.203
Observations	4256	4837	5150	4256	5459	5238

Table H.16: Effect of an electoral defeat of the incumbent on home visits by doctors and prenatal care

	Home visits by doctors			Prenatal care check-ups		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.05	-0.388**	-0.068	0.078	-0.068	-0.078
	(0.118)	(0.145)	(0.119)	(0.124)	(0.119)	(0.129)
Bandwidth	0.177	0.132	0.193	0.2	0.218	0.183
Observations	4852	3928	5080	5205	5402	4946

Table H.17: Effect of an electoral defeat of the incumbent on medical consultations

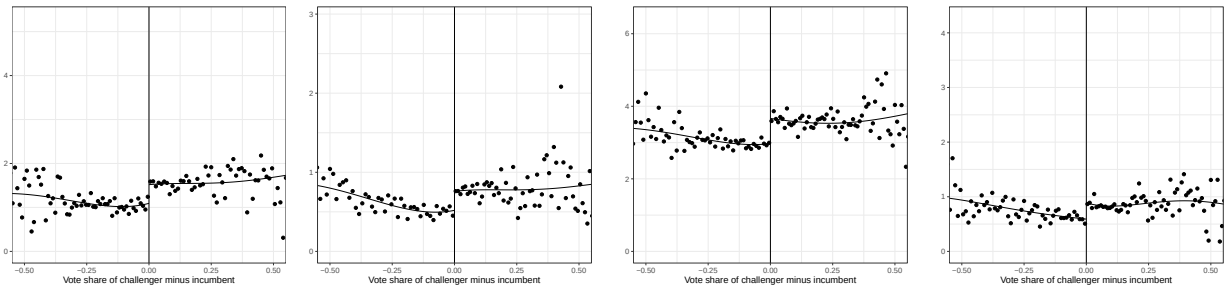
	Consultations with infants			Consultations with children		
	Q15	Q16	Q1	Q15	Q16	Q1
Incumbent defeated	0.023	-0.179	0.05	0.002	-0.237*	0.031
	(0.103)	(0.11)	(0.105)	(0.111)	(0.119)	(0.107)
Bandwidth	0.194	0.173	0.194	0.179	0.162	0.199
Observations	5103	4766	5095	4869	4555	5177

*p<0.05; **p<0.01; ***p<0.001. The bandwidth is determined by the algorithm of Calonico et al. (2020). Robust standard errors in parentheses. All regressions follow the specification in Equation 2 but omit controls. Dependent variables are in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

I Regression discontinuity plots for the main results

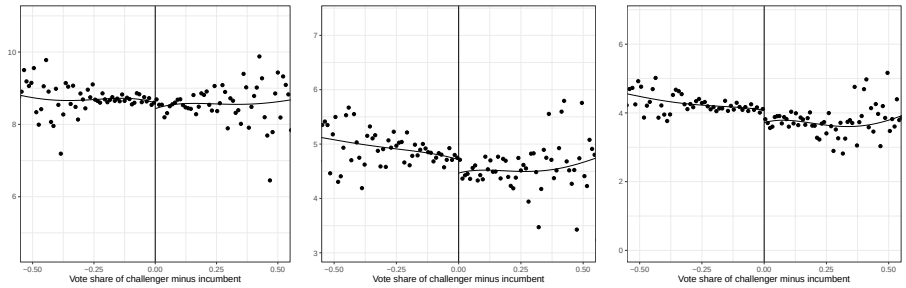
This Appendix presents the regression discontinuity plots (without covariate adjustment) for the main results. Plots for all other outcomes are available from the author.

Figure I.6: RD plots for the main results in Figure 2

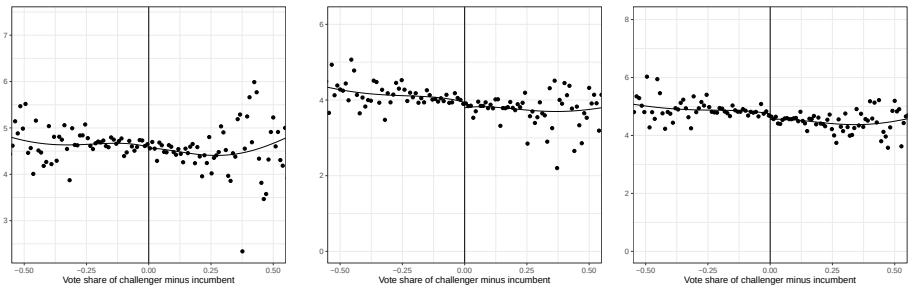


(a) Dismissals of temporaries in Q16 (b) Hires of civil servants in Q16 (c) Hires of temporaries in Q1 (d) Resignations of temporaries in Q16

Figure I.7: RD plots for the main results in Figure 3



(a) Home visits by health agents in Q16 (b) Home visits by nurses in Q16 (c) Home visits by doctors in Q16



(d) Prenatal care check-ups in Q16 (e) Medical consultations, infants in Q16 (f) Medical consultations, children in Q16

Dependent variables are in the natural log scale

J Characterization of municipalities with close elections

The table below characterizes the set of municipality-election observations where the election is close (i.e., the incumbent wins or loses by less than 15 or less than 10 points), relative to other observations where the mayor runs (first and second columns) and relative to all observations regardless of whether the mayor runs (third and fourth columns). Observations with close elections tend to be relatively smaller and poorer, and less likely to be in the southeast (relative to the northeast). Yet, observations within the bandwidth span the whole range of these socioeconomic variables.

Table J.18: Characterization of the regression discontinuity effective sample

	Mayor runs, 15 points	Mayor runs, 10 points	All, 15 points	All, 10 points
Population (logged)	-0.033^{***}	-0.022^{***}	-0.010^{***}	-0.007^{**}
	(0.004)	(0.005)	(0.003)	(0.002)
GDP per capita (logged)	-0.032^{***}	-0.018	-0.017^{**}	-0.010^{*}
	(0.009)	(0.009)	(0.006)	(0.005)
Deaths per capita	4.593	5.991	3.346	3.688^{*}
	(3.152)	(3.160)	(1.928)	(1.729)
Region fixed effects				
North	-0.042^{*}	-0.040^{*}	-0.004	-0.008
	(0.019)	(0.020)	(0.012)	(0.011)
South	0.023	0.016	-0.024^{*}	-0.018
	(0.018)	(0.019)	(0.011)	(0.010)
Southeast	-0.090^{***}	-0.089^{***}	-0.043^{***}	-0.043^{***}
	(0.015)	(0.015)	(0.009)	(0.008)
Center-west	-0.018	-0.039	0.002	-0.011
	(0.021)	(0.021)	(0.013)	(0.012)
Constant	1.189^{***}	0.799^{***}	0.482^{***}	0.320^{***}
	(0.077)	(0.077)	(0.047)	(0.042)
Election fixed effects	Yes	Yes	Yes	Yes
Observations	10169	10169	21903	21903
R-squared	0.020	0.013	0.006	0.005

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$. See Appendix E for variable definitions and sources. HC2 standard errors in brackets.

K Robustness of the main results to alternative bandwidths

To check the robustness of the results to alternative bandwidths, I replicate the results using as estimation bandwidth values from 0.05 to 0.4 (at intervals of 0.005).[49] I focus here on the most relevant findings, but results for all other outcomes are available from the author.

Figure K.8: Robustness of the main results in Figure 2 to alternative bandwidths

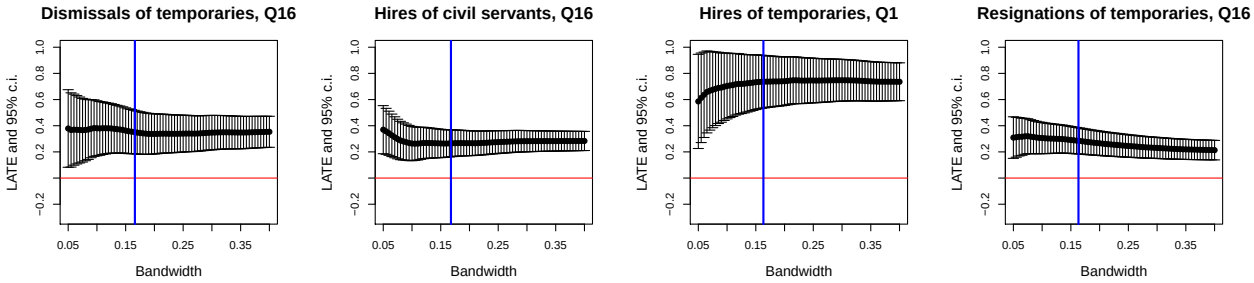
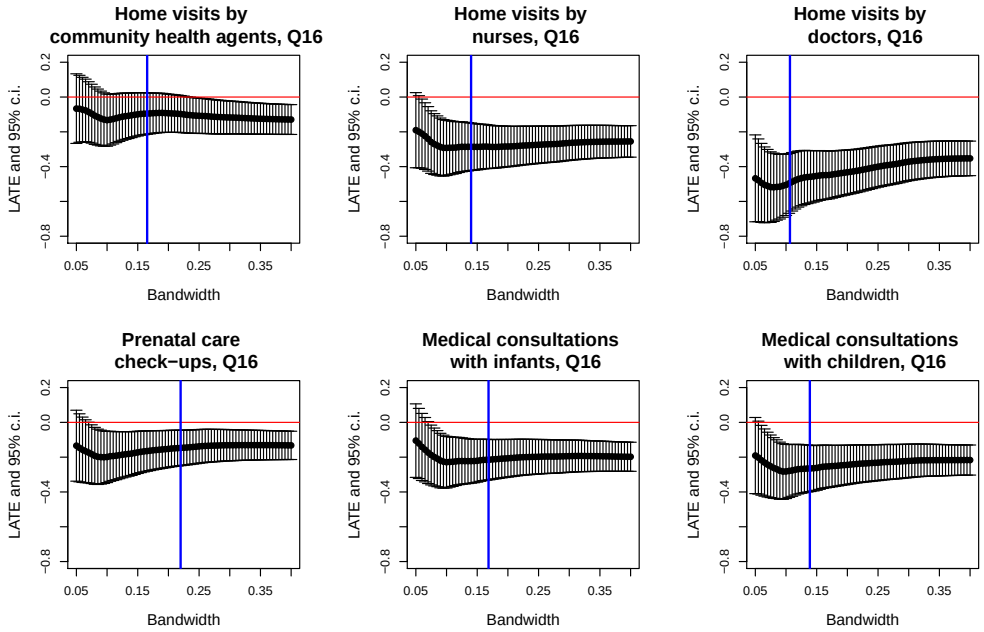


Figure K.9: Robustness of the main results in Figure 3 to alternative bandwidths



Vertical blue lines indicate the optimal bandwidth

[49] The robust bias-corrected estimation of Cattaneo et al. (2019) uses two bandwidths: an estimation bandwidth, and a bias-correction bandwidth. For this exercise, I use a bias-correction bandwidth equal to the chosen estimation bandwidth multiplied by the ratio of the estimation bandwidth to the bias-correction bandwidth in the main model where both are determined by the algorithm.

L Placebo tests with fake thresholds

As an additional robustness test, I run placebo tests where I change the regression discontinuity threshold to different points in the distribution of the forcing variable away from zero. Only 1 of 60 placebo tests returns statistically significant results, which is within what we would expect with $\alpha = 0.05$.

Figure L.10: Placebo tests varying the RD threshold for the main results in Figure 2

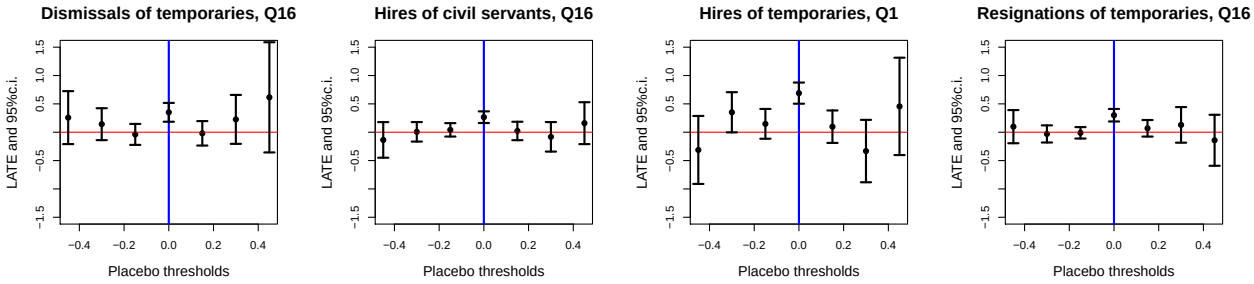
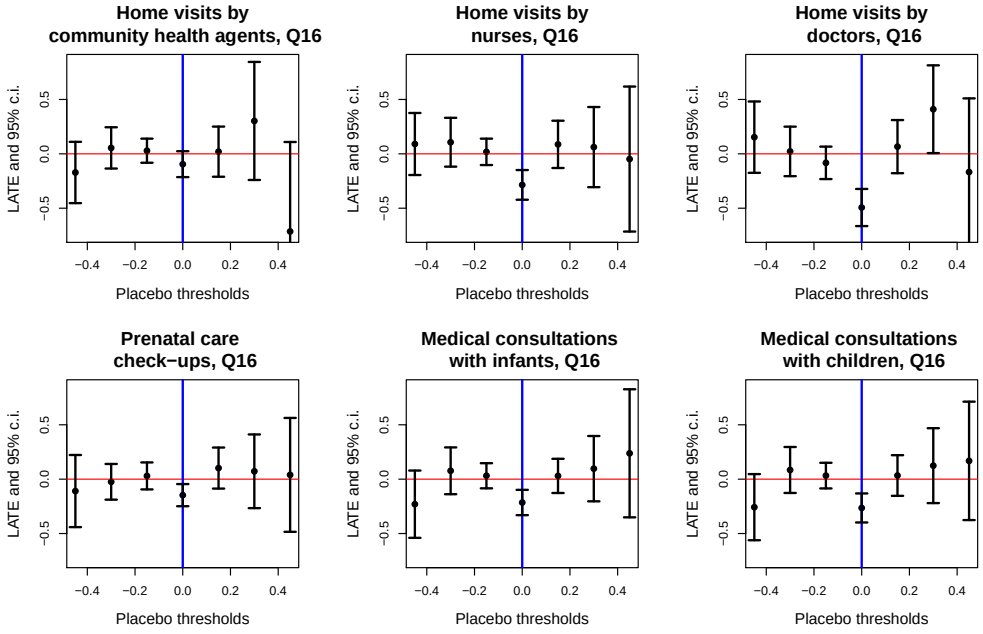


Figure L.11: Placebo tests varying the RD threshold for the main results in Figure 3



Vertical blue lines indicate the actual RD threshold

M Effects on the turnover of managers and non-managers

This Appendix examines effects on the turnover of employees in management positions, as identified through occupational identifiers in RAIS, and all other employees. Regression tables available from the author. The percentage of municipal contracts in with an occupation code corresponding to a management position ranges from 7.2% in 2004 to 8.6% in 2017.

Figure M.12: Effect of an electoral defeat of the incumbent on bureaucratic turnover among workers in management positions

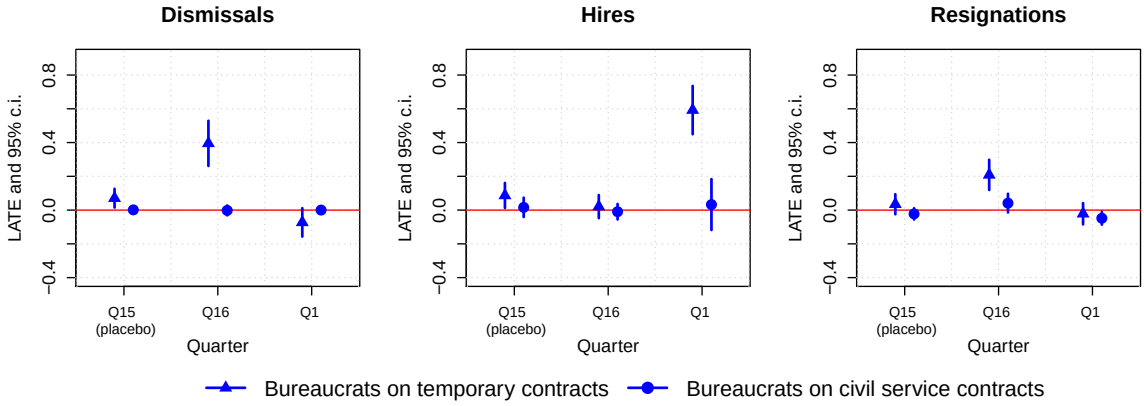
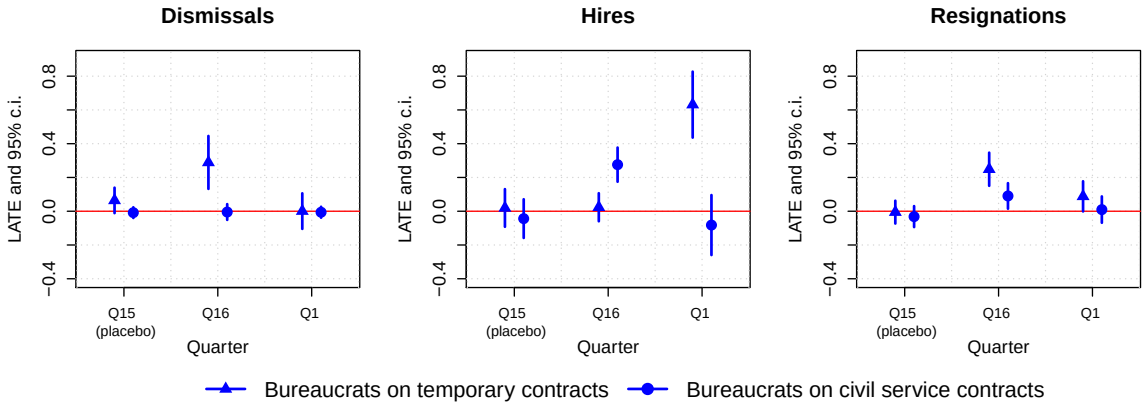


Figure M.13: Effect of an electoral defeat of the incumbent on bureaucratic turnover among workers in non-management positions

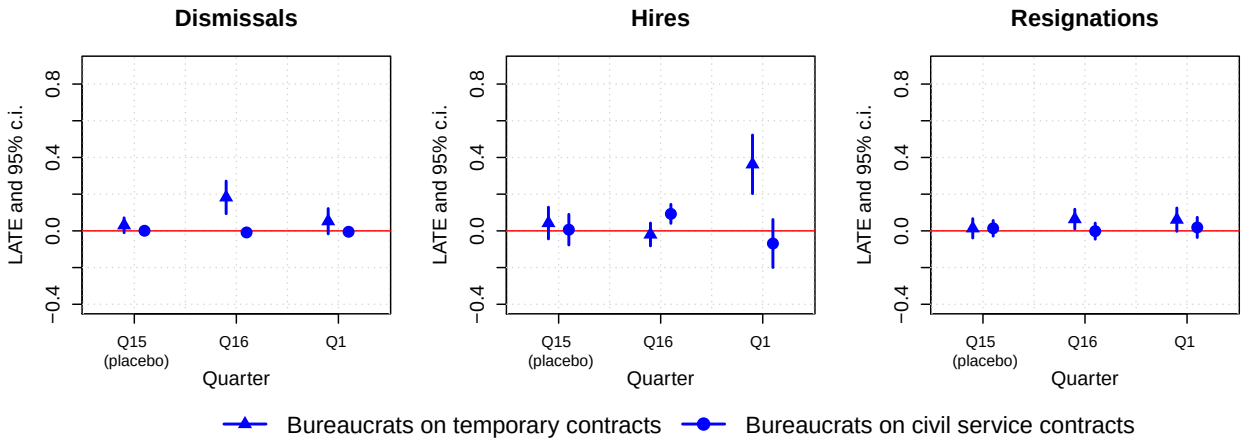


Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

N Effects on the turnover of specialized healthcare workers

This Appendix examines effects on the turnover of specialized healthcare workers, as identified through the occupational identifiers in RAIS. These include occupations like doctors, nurses, or community health agents, but do not include many workers in the healthcare sector that have more generic occupation codes, such as receptionists, cleaners, or drivers. The percentage of municipal contracts with an occupation code corresponding to specialized healthcare jobs ranges from 12% in 2004 to 16% in 2017.

Figure N.14: Effect of an electoral defeat of the incumbent on bureaucratic turnover among specialized healthcare workers



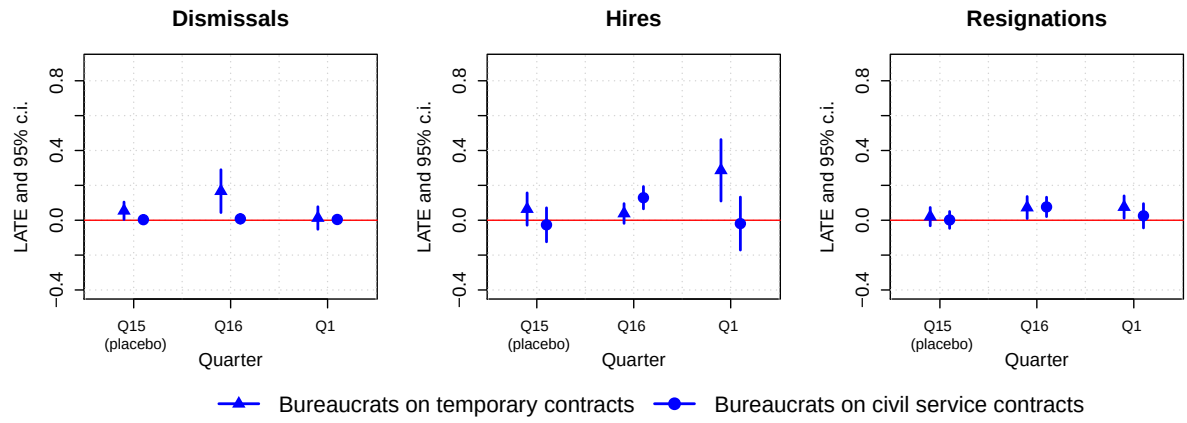
Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

Among employees identified as healthcare professionals, the effects of an electoral defeat of the incumbent appear less pronounced than among the whole set of bureaucrats. In particular, electoral turnover leads to an increase of 19.7% in the dismissal of temporary workers in the last quarter of the loser's mandate ($p < 0.001$), an increase of 9.6% in the hiring of civil servants in that same quarter ($p < 0.001$), and an increase of 43.9% in the hiring of temporaries in the first quarter of the winner's ($p < 0.001$). All other effects are statistically insignificant. Regression tables are available from the author.

O Effects on the turnover of specialized education workers

This Appendix examines effects on the turnover of specialized education workers, as identified through the occupational identifiers in RAIS. These include teachers and other education occupations like school inspectors, but do not include many workers in the education sector that have more generic occupation codes, such as receptionists, cleaners, or drivers. The percentage of municipal contracts with an occupation code corresponding to specialized education jobs ranges from 27% in 2008 to 30% in 2017.

Figure O.15: Effect of an electoral defeat of the incumbent on bureaucratic turnover among specialized education workers



Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

Among employees identified as education professionals, the effects of an electoral defeat of the incumbent appear less pronounced than among the whole set of bureaucrats. In particular, electoral turnover leads to an increase of 16.7% in the dismissal of temporary workers in the last quarter of the election year ($p < 0.01$), an increase of 13.31% in the hiring of civil servants in that same quarter ($p < 0.001$), an increase of 32.98% in the hiring of temporaries in the first quarter of the winner's mandate ($p < 0.01$), increases of 6.71% in the resignations of temporaries both in the last quarter of the year and the first quarter of the winner's mandate ($p < 0.01$), and an increase of 7.03% in the resignation of civil servants in the quarter of the election ($p < 0.01$). All other effects are statistically insignificant. Regression tables are available from the author.

P Effects on the turnover of low- versus high-pay bureaucrats

This Appendix shows the results when considering only bureaucrats whose mean salary is below or above the median of municipal employee salaries for a given year. The point estimate for the dismissal of temporaries in the last quarter of the mayor's mandate is almost twice as large for high-pay than for low-pay employees, although the difference is not statistically significant.

Figure P.16: Effect of an electoral defeat of the incumbent on bureaucratic turnover among low-pay bureaucrats

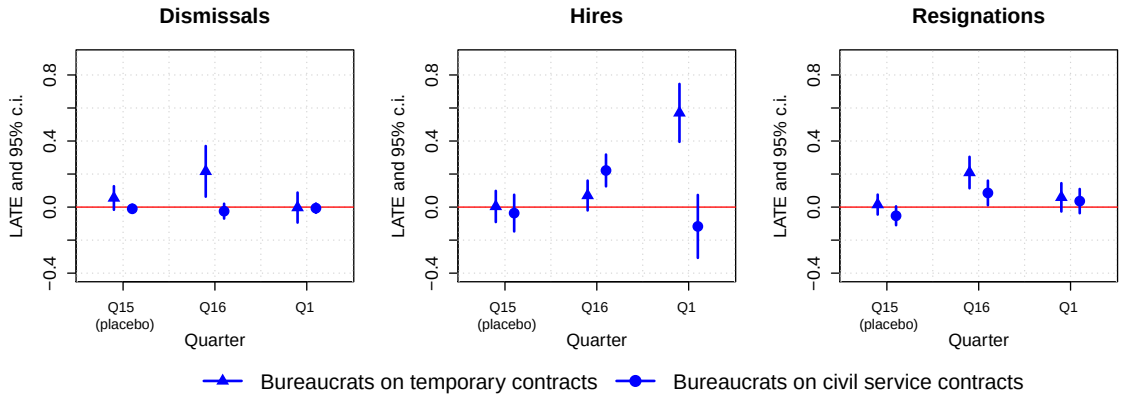
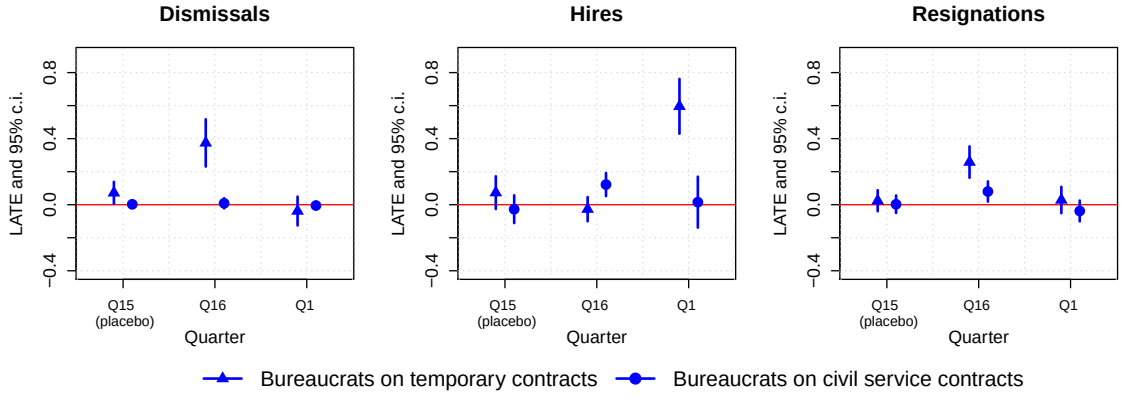


Figure P.17: Effect of an electoral defeat of the incumbent on bureaucratic turnover among high-pay bureaucrats

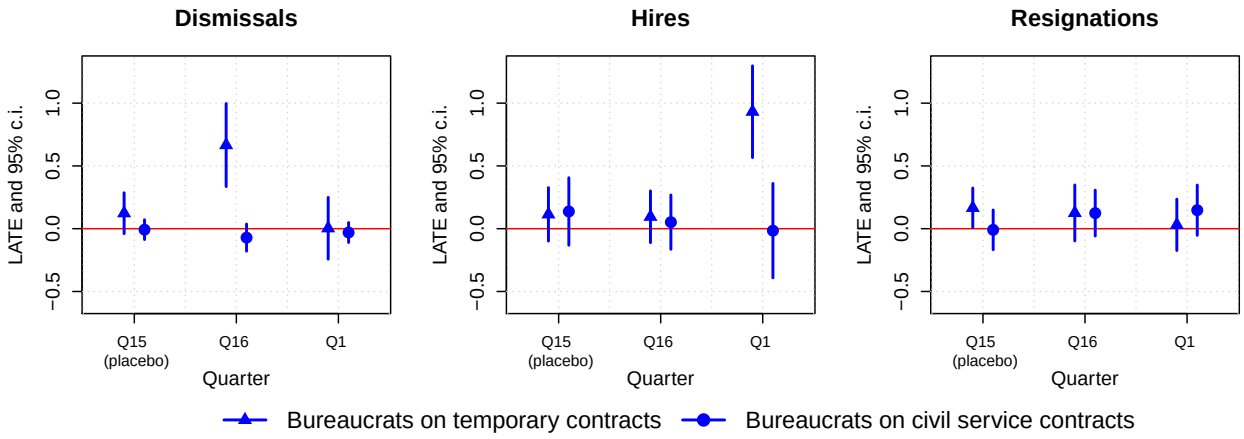


Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

Q Effects on bureaucratic turnover when the incumbent mayor belongs to a large programmatic party

This Appendix examines effects on the turnover in cases where the incumbent was elected under the label of one of the two large programmatic parties in Brazil during the 2004-2016 period, PT and PSDB. The results show that in these cases electoral turnover does not lead to an increase in the hiring of civil service employees under the lame-duck government. All other results are similar to those in Figure 2, except for the larger confidence intervals resulting from a smaller sample.[50] This suggests that increases in civil service hiring after an electoral defeat are unlikely to be motivated by policy concerns. Still, these heterogeneity analyses need to be taken with caution – the partisanship of the mayor could be correlated with both observable and unobservable characteristics of the municipality and the incumbent which could explain this variation.

Figure Q.18: Effect of an electoral defeat of the incumbent on bureaucratic turnover in municipalities where the incumbent belongs to a large programmatic party



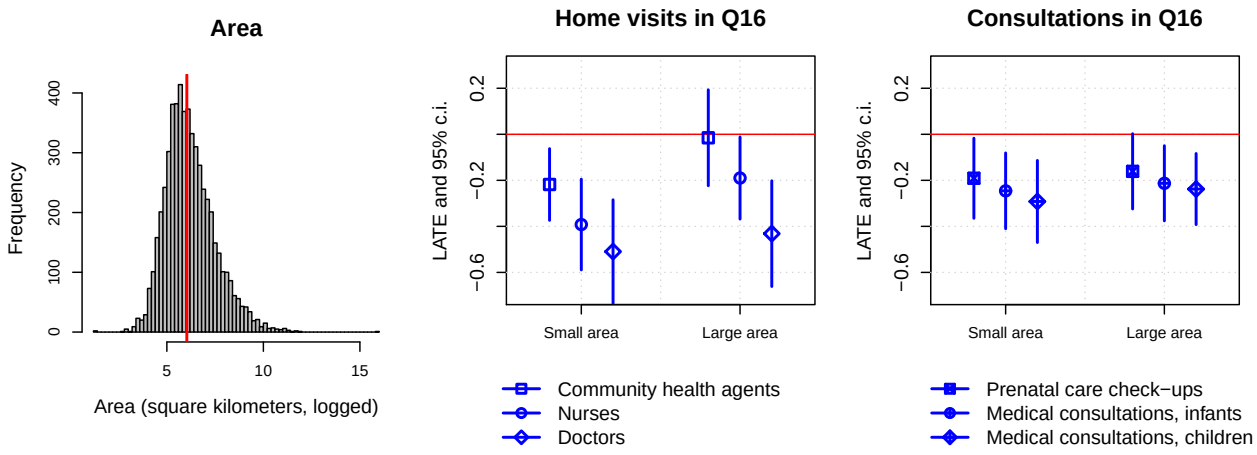
Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q15 corresponds to the 15th quarter of a mayor's mandate (i.e., July through September of its last year). Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. Results for Q15 are placebo tests.

[50] 23% of the cases where the mayor runs for reelection have a mayor who was elected in a PT or a PSDB ticket. Regression tables are available from the author.

R Effects on public service delivery by municipality area

This Appendix explores how results in Figure 3 differ by whether the municipality's surface is small or large, and in particular by whether its area is below or above the median. Regression tables are available from the author. Results below show that smaller and larger municipalities see similar declines in public service delivery, with the exception of home visits by community health agents which see a decline in smaller municipalities but not in larger ones. These results suggest that disruptions to transportation are not the main mechanism driving the connection between electoral turnover and the declines in public service delivery.

Figure R.19: Effect of an electoral defeat of the incumbent on bureaucratic turnover, by whether the municipality's area is below or above the median



Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st.

S Characterization of municipalities by share of healthcare professionals in the civil service

The table below characterizes the set of municipality-election observations by the share of healthcare professionals who, in the quarter before the election, are in the civil service. Figure 4 shows that municipalities where all specialized healthcare workers are (not) in the civil service do (not) experience significant declines in the delivery of healthcare services. Examining those two extreme types of municipalities is useful because it allows us to rule out the hypothesis that declines are driven purely by bureaucratic turnover. Yet, these municipalities tend to be smaller. Moreover, municipalities where all healthcare professionals are (not) in the civil service are poorer (wealthier) and have lower (higher) mortality rates.

Table S.19: Characterization of municipalities by their share of healthcare professionals in the civil service

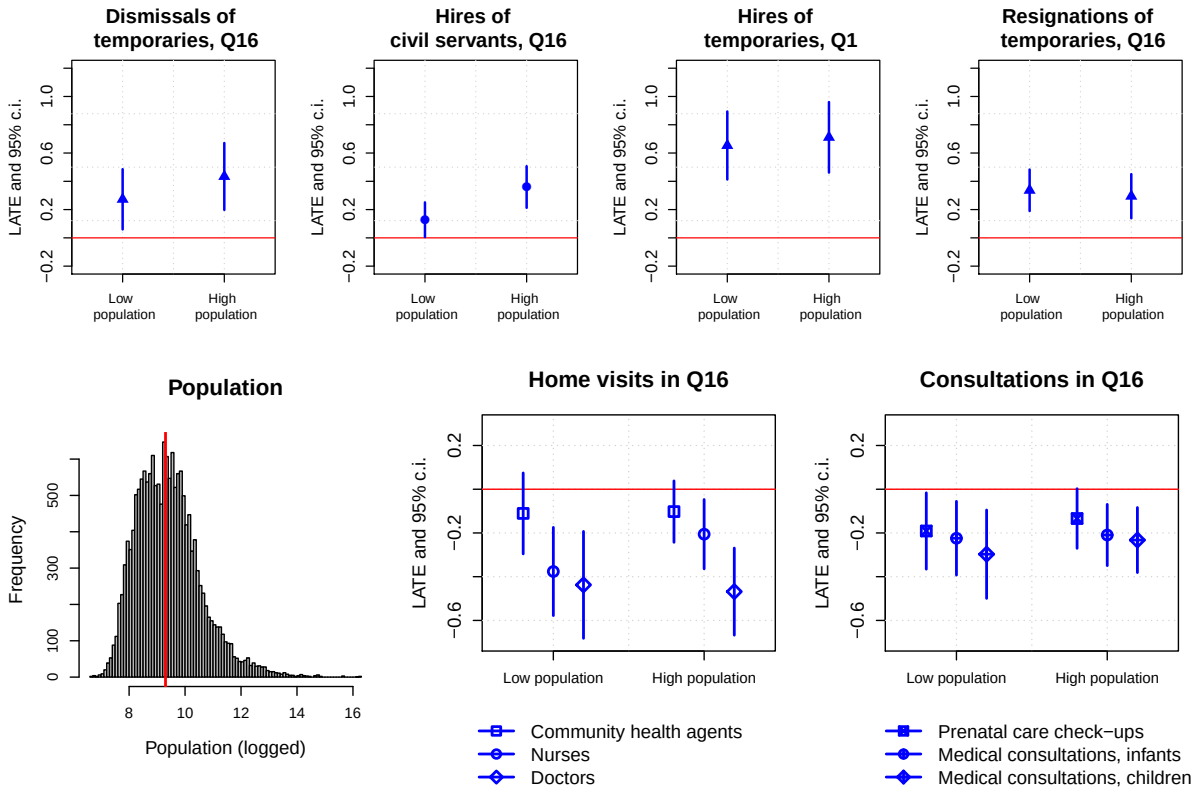
	All civil servants	All temporaries	Share civil servants
Population (logged)	-0.039^{***}	-0.015^{***}	-0.002^{**}
	(0.003)	(0.002)	(0.002)
GDP per capita (logged)	-0.058^{***}	0.041^{***}	-0.033^{**}
	(0.005)	(0.004)	(0.005)
Deaths per capita	-7.487^{***}	5.905^{***}	-2.959
	(1.815)	(1.351)	(1.526)
Region fixed effects			
North	-0.109^{***}	0.024^{**}	-0.109^{*}
	(0.012)	(0.009)	(0.010)
South	-0.032^{**}	-0.058^{***}	-0.024^{**}
	(0.011)	(0.008)	(0.009)
Southeast	-0.100^{***}	0.051^{***}	-0.140^{**}
	(0.009)	(0.007)	(0.007)
Center-west	0.011	-0.101^{***}	0.061^{*}
	(0.013)	(0.010)	(0.011)
Constant	1.302^{***}	-0.100^{**}	1.015^{*}
	(0.045)	(0.034)	(0.038)
Election cycle fixed effects	Yes	Yes	Yes
Observations	20699	20699	20699
R-squared	0.065	0.038	0.050

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$. See Appendix E for variable definitions and sources. HC2 standard errors in brackets.

T Heterogeneity of effects by population

This Appendix explores how results in Figures 2 and 3 differ by municipality population, an in particular by whether the local population is above or below the median for a given year. Regression tables are available from the author. In contrast to GDP per capita (Figure 5), there is no discernible heterogeneity by population: observations below and above the median municipality population for a given year experience remarkably similar effects.

Figure T.20: Effect of an electoral defeat of the incumbent on bureaucratic turnover and healthcare service delivery, by whether the municipality's population is below or above the median for that year



Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. The red line on the histogram marks the median.

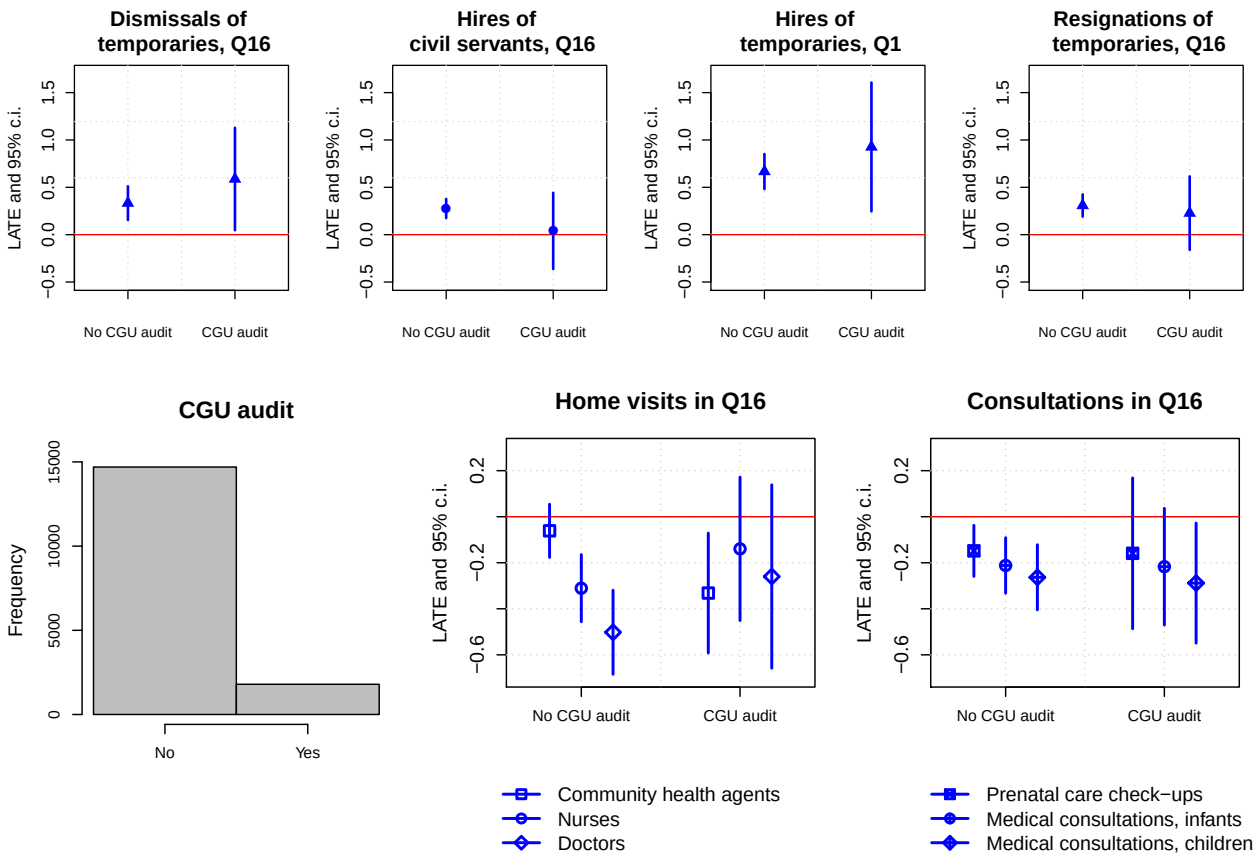
U Heterogeneity of effects by randomized anti-corruption audits

This Appendix explores how results in Figures 2 and 3 differ by whether the municipality experiences a random federal audit during the first three years of the incumbent's mandate. Brazil's federal comptroller's office (CGU, *Controladoria-Geral da União*) has long targeted its audits through randomized lotteries. The CGU releases the results of the audits to the media and to other accountability actors like the federal prosecutor's office, the audit court, and the police, as well as to the municipal legislative chamber.[51] These randomized audits have been found to to decrease corruption and increase the chances that mayors will be prosecuted for corruption charges (Avis et al., 2018).

As shown in Figure U.21, there is no significant heterogeneity by random audits. If anything, randomized audits appear to increase the effect of an incumbent defeat on the dismissal of temporaries and to reduce its effect on the hiring of civil servants in the last quarter of the mayor's mandate. This is consistent with those effects being motivated by a desire to "clean the accounts" before leaving office, on the one hand, and to use the civil service to constrain the opponent's hiring discretion, on the other. These differences are however not statistically significant. The randomized audits do not seem to alter the effect of an electoral defeat of the incumbent on the delivery of healthcare services. Regression tables are available from the author.

[51] I focus on audits assigned during the first three years of the mayor's mandate because there is a substantial lag between the date of the lottery, the dates of auditors' field visit to the municipality, and the date when the audit report is published. Results are similar however when including lotteries done in the year of the election. Details of these randomized audits are described by Avis et al. (2018).

Figure U.21: Effect of an electoral defeat of the incumbent on bureaucratic turnover and healthcare service delivery, by whether the municipality is audited by the CGU during the incumbent's mandate



Each point and its robust bias-corrected confidence interval comes from a separate local linear regression discontinuity model, as per Equation 2. The dependent variable is in the natural-log scale. Q16 corresponds to the 16th and last quarter of a mayor's mandate (i.e., October through December). Q1 corresponds to the first quarter of the election winner's mandate (i.e., January through March). Elections take place on the first Sunday of October, and winners are sworn in on January 1st. The red line on the histogram marks the median.