Electoral Cycles in Female Sterilization*

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Abstract

Many women across the world face substantial challenges in obtaining access to family planning — an important problem emphasized by the Sustainable Development Goals. The present study explores electoral cycles in female sterilization, the most prevalent contraceptive method in the world. We focus on Brazil, a country where many women have unmet demands for sterilization and often queue for many months or even years for their surgeries. Qualitative evidence suggests that local politicians manipulate the provision of publicly funded tubal ligation surgeries for political purposes. We analyze the universe of tubal ligation surgeries performed by the public health system, using regression analysis to examine variation across Brazilian municipalities in 1998-2019. We find that female sterilizations increase 8.8% during municipal election years. Moreover, they surge during electoral campaigns: female sterilizations increase 30.5% in the three months before municipal elections. Findings are similar when adjusting for overall hospitalizations, which rise less than 1% during municipal elections. Female sterilizations have more pronounced electoral cycles than do other elective surgeries (including vasectomies), and no cycles are detected for emergency surgeries. Electoral cycles in female sterilization are concentrated among nonwhite Brazilians, who face substantial health disparities. Female sterilizations increase far more during municipal than national elections, and they spike especially in poor municipalities and in the Northeast region. More broadly, our findings suggest that Brazilian politicians distort the public provision of contraception, a crucial problem not least because family planning is widely deemed a basic human right.

Keywords: Sterilization; Family Planning; Brazil; Electoral Cycles; Political Budget Cycles; Clientelism

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The freedom to choose the number and spacing of one's children is widely understood to be a basic human right.[1] For decades, international agencies have called for universal access to family planning: this objective was included in the 1994 International Conference on Population and Development, the Millennium Development Goals, and the Sustainable Development Goals. Despite marked improvements in recent years, many women across the world continue to face substantial challenges in obtaining access to family planning. Nearly a quarter of women globally who want to delay or avoid pregnancy have an unmet need for family planning, even though the number of modern contraceptive users has nearly doubled since 1990 (United Nations, 2022).

The present study focuses on female sterilization, one of the world's leading contraceptive methods. Despite recent declines, female sterilization continues to be the most prevalent form of contraception worldwide, used by 23% of married women of reproductive age, followed by condoms, IUDs and the pill — and is an order of magnitude more common than male sterilization (United Nations, 2022).[2] Unlike studies that investigate how politicians in various countries have coerced women to be sterilized,[3] we explore politicians' actions in a context where women have large unmet demands for sterilization. More specifically, we examine the case of Brazil, where women seeking tubal ligations from the public health system must often queue for many months or even years to be sterilized. This study is motivated by substantial qualitative evidence discussed below, which suggests that local politicians in Brazil often manipulate the provision of publicly funded tubal ligation surgeries for political purposes.

In this context with substantial unmet demand, our regression analyses reveal pronounced electoral cycles in female sterilization. We analyze the universe of tubal ligations provided by Brazil's public health system across over 5,500 municipalities between 1998 and 2019. Leveraging both across-year and within-year variation, we estimate whether tubal ligation rates rise in election periods, controlling for long-term trends, seasonality, and municipal characteristics. We show that over these two decades, the public provision of tubal ligations

increased by 8.8% during municipal election years. Even more remarkably, this increase was concentrated in the three months immediately preceding municipal elections, when female sterilizations surged by 30.5%. Results are similar when controlling for broader electoral cycles in inpatient procedures, which increase by less than 1% during municipal elections. We find significant but considerably smaller electoral cycles when examining other elective surgeries with long queues (including vasectomies), but no such cycles when examining emergency surgeries. Electoral cycles in female sterilization are concentrated among nonwhite Brazilians, who face substantial health disparities. Female sterilizations increase far more during municipal than national elections, and they surge especially sharply in poor municipalities and in the Northeast region.

These findings contribute to the broader literature on political budget cycles. Many scholars, building on seminal works of Nordhaus (1975), Tufte (1975), and Rogoff & Sibert (1988), have investigated the logic and conditions that lead politicians to shift fiscal and other policies according to the timing of elections. Numerous empirical studies suggest that incumbents increase expenditures just before elections, at both the national and subnational level.[4] Politicians often increase their provision of targetable benefits that are highly valued by voters (Brender & Drazen, 2005; Drazen & Eslava, 2010). Our quantitative findings add to this literature by showing that political budget cycles similarly affect the public provision of female sterilizations in Brazil, where the procedure is not only a leading contraceptive method but is also one of the most demanded elective surgeries. While our results are consistent with theories that suggest politicians distort expenditures during election campaigns to signal competence or demonstrate policy preferences to voters (e.g., Persson & Tabellini, 2000; Rogoff, 1990), they are also consistent with Hanusch & Keefer's (2014) argument that clientelism often contributes to political budget cycles. As discussed below, court cases indicate that some Brazilian politicians offer sterilizations in *quid pro quo* exchange for votes during election campaigns.

1 Context and Qualitative Evidence

Our study focuses on electoral cycles in tubal ligation surgeries performed by Brazil's public health system (commonly known as SUS for *Sistema Único de Saúde*, or Unified Health System). The 1988 Constitution guarantees universal, comprehensive healthcare, and most Brazilians — especially those who are poor or nonwhite — obtain medical care exclusively from SUS.[5] According to the nation's census bureau, nearly 72% of Brazilians rely exclusively on SUS for their healthcare; among black and brown Brazilians, this share is 80% and 81%, respectively (IBGE, 2020).[6] Given our focus on how sterilizations surge during municipal elections — held concurrently every four years nationwide to elect mayors and city councilors[7] — it deserves emphasis that municipalities have considerable resources and discretion with respect to SUS expenditures. Each level of government has duties in administering SUS, with transfers to municipalities accounting for the largest share of public health care expenditures: nearly 48% in 2013 (TCU, 2014). Furthermore, federal audit court reports suggest that municipal officials have significant autonomy when providing some healthcare services, frequently with little oversight at the state level (TCU, 2011).

Over the past three decades, female sterilization in Brazil has transformed from an illegal (albeit prevalent) method to a publicly funded method of contraception. Tubal ligation — a surgical procedure that aims to prevent pregnancy by cutting, sealing or tying a woman's fallopian tubes — was illegal and banned by medical ethics code until 1997 without "precise indication approved by two medical doctors." Though illegal, sterilizations were not criminalized, and doctors commonly employed successive cesareans as a rationale for performing tubal ligations (Caetano & Potter, 2004). In a radical departure from previous policy, and after substantial effort from civil society organizations, Law 9263 legalized and provided public funding for sterilization. This law specified that recipients must be at least 25 years old or already have two living children, and must undergo a 60-day waiting period with required consultations. After the passing of Law 9263, doctors performed 1,060,549 publicly funded tubal ligations between 1998 and 2019. These procedures are performed in a hospital setting

under anesthesia and typically require inpatient care, trained surgical staff, and access to an operating room. During our study period, the number of female sterilizations performed by SUS increased for a decade before stabilizing.[8] As shown in Figure 1 and explored more rigorously below, this provision of tubal ligations increases substantially during municipal election campaigns.

[Figure 1 about here]

Despite expanded access in recent years, there is substantial unmet demand for female sterilization. Across the public healthcare system, SUS users often complain about accessibility and long waiting times (SIPS, 2011). In a representative survey conducted by the Federal Council of Medicine (CFM) in 2018, 68% of respondents said it was "difficult or "very difficult" to obtain surgeries from SUS (CFM, 2018).[9] Queues were the most common complaint, with 61% reporting that wait times for surgeries were "bad" or "terrible." Moreover, 39% of respondents reported that they were currently waiting for an appointment or surgery from SUS: of these, 29% had already waited a year, and another 16% had waited 6-12 months. Administrative data similarly show long queues. An unprecedented CFM study discovered there were waiting lists for 904,000 elective surgeries in 2017, based on data reported from states representing only half of Brazil's surgeries (CFM, 2017a, 2017b).[10] Of these patients, 59% had already queued for six months, and 13% had queued for 18 months. Data from Minas Gerais provide a glimpse into the scale of unmet demand for tubal ligations: in 2017, the state had 11,249 women on the waiting list for procedure — over double the number actually performed in Minas Gerais that entire year (4,905).[11] Numerous studies and journalists have documented the long waiting times facing women who seek sterilizations from the public health system.[12] More broadly, Brazil's government recognizes this major issue and has taken strides to reduce waiting times for elective surgeries, including the launch of a "National Queue Reduction Program" in 2023.[13]

As this study examines rigorously, amidst this substantial unmet demand and lengthy queues, politicians distort the timing of when public hospitals perform female sterilizations

for electoral purposes. Brazil's electoral laws forbid politicians from engaging in such practices, regardless of whether tubal ligations are provided in *quid pro quo* exchange for votes (i.e., clientelism). During election years, Law 9504 prohibits politicians from distributing free goods and services beyond what was already budgeted during the prior fiscal year, except during certain emergencies. Moreover, Brazil's 1965 Electoral Code prohibits clientelism: it is a violation of criminal law "to give, offer, promise, solicit or receive, for oneself or for another, money, gifts, or any other benefits, in order to obtain or give a vote, or to obtain or promote abstention, even if the offer is not accepted." Beyond criminal charges, electoral judges can impose swift administrative sanctions through Law 9840 (Reis, 2006; Tozzi, 2008): over a thousand politicians were ousted between 2000-11 for electoral clientelism, the top reason for politician removals in Brazil (Nichter, 2021).

We first provide qualitative evidence of the use of female sterilization for clientelist purposes, a phenomenon with long precedent in Brazil.[14] In 1993, a national Parliamentary Inquiry Commission (CPI) focused on tubal ligations more broadly concluded that "the use of surgical sterilization in exchange for votes is now a frequent occurrence in various parts of the country" (Congresso Nacional, 1993). The CPI, which urged criminal investigations, based its assessment on evidence uncovered by state-level commissions, numerous congressional witnesses, and press reports. Journalists have also long reported on the issue. As one example, a 1990 news article entitled "Clientelism: Candidate Ties Tubes in Pirambu" — one of Brazil's largest favelas — led to criminal investigations against a doctor-candidate who reportedly sterilized women "in exchange for votes" and affixed campaign paraphernalia on three cars transporting "electoral clients on the day of surgery."[15] Caetano & Potter (2004), who study the period before female sterilizations were legalized in Brazil, also provide evidence of their clientelist provision during election campaigns. This practice continued after Law 9263 legalized and provided public funding for female sterilization. Indeed, a leading television news program (*Fantástico*) reported on the use of female sterilization for vote buying in 2012,[16] and prominent anti-clientelism organizations even publicly warned voters

of the practice in 2010: "If you are ever offered sterilization or tubal ligation in exchange for your vote ... report it!"[17] As explained by an ex-federal deputy in 2011, many politicians "have highly vulnerable voters, who depend on clientelist actions ... In general, it's an individualized good: I give you a tubal ligation, a job, and you give me a vote."[18]

To glean further insight, consider several examples of Brazilian politicians convicted for the clientelist provision of female sterilizations. According to Brazil's highest court, a mayoral candidate engaged in this practice during the 2004 campaign in Marabá, Pará.[19] The candidate's campaign recruited 13 women (with the help of his stepdaughter, a candidate for city council) to receive free tubal ligations in direct exchange for their votes. They were sterilized by the candidate's son-in-law and another doctor in a local hospital. Contrary to the legally mandated 60-day waiting period, some of the women testified that they underwent surgery the same day they signed up. Two women testified that they regretted being sterilized and had not received the required consultations to review alternative contraception methods. A judge declared that the candidate's "electoral corruption ... surpassed the limits imaginable of humanity," sentencing him to house arrest for three years and a monetary fine.

In Porto Velho, Rondônia, a city councilor candidate was sentenced to three years in prison for buying votes with female sterilization in the 2004 electoral campaign. According to the judicial ruling, the candidate explained to numerous women that he was "scheduling tubal ligation surgeries free of charge for patients, so long as they showed support for said candidate, voting for him in that year's elections and getting family and friends to do the same."[20] Women who agreed to the terms had to provide their voter registration numbers and other personal details, and were told when to arrive at his campaign office for transportation to the hospital. Numerous women testified that they exchanged their votes for sterilization, and that the candidate — who was a doctor and former city councilor — performed the surgeries himself.

In Goianápolis, Goiás, a city councilor candidate was convicted of clientelism during the 2008 campaign. According to court documents, the candidate promised a free tubal

ligation surgery to a woman in exchange for the votes of her and her husband.[21] When driving her to the hospital a few weeks before the election, the candidate emphasized that he needed their votes, and discussed how he frequently helped others to become sterilized. A complication during the tubal ligation surgery led to the discovery of this vote-buying scheme; the municipality's Secretary of Health became suspicious because the surgery had not been arranged following protocol. Upon questioning, the woman admitted the *quid pro quo* nature of the exchange. When issuing its final verdict, Goiás's state electoral court ruled that "there was no other motive for the tubal ligation surgery than to acquire the vote and support of the voter and her family." The candidate was removed from office, fined, and became ineligible to run for elected office for eight years.

In the state of Rio de Janeiro, a politician was ousted as mayor for vote buying in 2005, only to engage in clientelism yet again when running for state deputy in 2010.[22] During the 2010 election, the candidate and his brother — both physicians at a medical clinic associated with the public health system — were each convicted of providing tubal ligations to women in exchange for their votes. Witnesses reported to police that while at the clinic, they were instructed to vote for the candidate in exchange for their sterilizations, received his campaign materials, and were asked for their voter documents. A 29-year-old who received a tubal ligation reported being told that she would get "the operation for free, if I would help him elect his brother."[23] Upon conviction, electoral authorities overturned the politician's election and declared him ineligible to run for public office for eight years.[24]

As a final example involving clientelism, a city councilor in São José de Ribamar, Maranhão was found guilty of the clientelist provision of sterilizations during the 2020 election. According to court documents, he spearheaded "an illicit scheme to schedule appointments and surgeries in the public health system ... in exchange for the promise of votes."[25] Search warrants revealed that his campaign possessed medical consultation forms that listed not only citizens' names but also detailed voter registration information. Moreover, authorities discovered audio recordings in which staff reminded tubal ligation recipients not to "forget"

their "commitment to us," and also discussed the need to "demand votes from the people on the list" so they would "honor the word they gave to vote for the candidate." Maranhão's state electoral court removed the city councilor from office, imposed a fine, and ruled him ineligible to hold public office for eight years.

Taken together, the qualitative evidence presented thus far suggests that some Brazilian politicians engage in the clientelist provision of tubal ligations during elections. However, clientelism is by no means the only explanation for electoral cycles in female sterilization. As discussed in the Introduction, an extensive literature on political budget cycles — which does not focus on clientelism — investigates other key reasons why politicians often have incentives to increase expenditures during campaigns. Some quantitative studies, which focus on neither clientelism nor healthcare, identify political budget cycles in Brazil (e.g., Klein and Sakurai, 2015; Sakurai and Menezes-Filho, 2011). Moreover, when we interviewed 71 local politicians and other elites in Northeast Brazil, many noted that incumbents temporarily provide more healthcare and other services before elections.[26] For example, a city councilor explained: "Generally, the mayor, during election time, does many programs for the community — assistance for everyone who needs healthcare."[27] Likewise, a party leader explained that "healthcare, when it's election time, always has better service. Sometimes they place more doctors, they treat people better, for fear of losing votes."[28] To the extent that incumbents undertake such actions, electoral cycles may be observed even without clientelism.

With respect to female sterilization in particular, qualitative evidence also discusses electoral cycles without specifically mentioning *quid pro quo* exchanges. In a leading newspaper in 1988, a doctor involved in a public health commission explained that tubal ligations were "always" used "during election periods ... to obtain votes of the poorest population," and a nurse claimed that "female sterilization substantially grows during electoral campaigns."[29] In a study by Caetano (2000), one sterilized woman explained that: "it was election time and during these periods many doctors and politicians do this and that for free. Tubal ligations,

especially, were at the peak! The day I went to have my surgery there were about 12 women who would have tubal ligations."

Altogether, this qualitative evidence sheds light on politicians' use of female sterilization for political purposes. Consistent with such evidence, quantitative analyses below reveal electoral cycles in female sterilizations. However, we emphasize at the outset that our regressions do not enable us to parse the mechanisms underlying why the public provision of tubal ligation surgeries surges during election campaigns. As discussed in the Conclusion, further research is needed to examine the extent to which sterilizations increase due to clientelism (i.e., direct, contingent exchange), versus other reasons for boosting expenditures during elections such as generating goodwill, conveying policy effectiveness, and demonstrating policy preferences.

2 Data

To investigate the dynamics of public healthcare provision, we employ rich administrative data from DATASUS, collected by Brazil's Ministry of Health. We use Hospital Admission Authorizations (*Autorizações de Internação Hospitalar*, or AIHs), which are mandatory forms that healthcare providers must submit when admitting patients in order to receive reimbursement from SUS. These data provide detailed case-level information on the universe of hospitalizations in Brazil's public healthcare system, including location, timing, procedures performed, and demographic characteristics of admitted patients.[30] We use the SUS data to construct municipal-level procedure rates, with our key dependent variable measured as the number of tubal ligation surgeries per 100,000 women of reproductive age (i.e., 15 to 49 years), employing 2000 population data from Brazil's census bureau (*Instituto Brasileiro de Geografia e Estatística*, or IBGE). While the tubal ligation rate is our primary outcome of interest, we also compute procedure rates (using the medically relevant population as the denominator) for several other common inpatient procedures, involving both elective surgeries (vasectomies, hernia repairs, gallbladder removals, and cataracts) and emergency surgeries

(appendectomies and to treat heart attacks) — as well as the overall number of inpatient procedures (AIHs). We examine hospitalizations between January 1998 and December 2019, spanning the period Brazil's government broadly provided public female sterilizations before the COVID-19 pandemic. Hence, our analysis examines a monthly panel of Brazilian municipalities covering 21 years.

Our analysis is centered around municipal elections, as local politicians and officials play a pivotal role in administering public healthcare services in Brazil. According to the Ministry of Health, municipalities are responsible for implementing the public health system in their territory, using their own resources as well as federal and state transfers, and they play a role in formulating healthcare policies.[31] Local politicians thus have considerable influence over the timing and volume of healthcare provision. Our primary specifications focus on tubal ligations performed on women residing in any of Brazil's 3,006 municipalities with a hospital.[32] This sample reflects 78% of publicly provided sterilizations in 1998-2019, and are the tubal ligations most subject to political manipulation by local politicians.[33] Furthermore, we focus our analysis on tubal ligations performed separately from a cesarean delivery, as the timing of such procedures is anchored to the timing of childbirth and is therefore less susceptible to electoral cycles. However, we underscore that all findings hold when investigating the universe of all publicly provided tubal ligation surgeries. As shown in Appendix Tables A3, A6, A8, and A8, results are similar and remain significant when analyzing all female sterilizations across all of the more than 5,500 municipalities in Brazil.

3 Methodology

3.1 Electoral Cycles in Female Sterilization: Annual Variation

We employ two approaches to show the robustness of our results. The first empirical strategy estimates the relationship between the timing of elections and rates of tubal ligation using year-level variation. This approach simply assesses whether election years are associated with higher levels of female sterilizations, controlling for broad time trends and municipality

characteristics. More specifically, we estimate the following regression:

$$y_{mt} = \tau \text{ Election Year}_t + \beta X_{mt} + \theta_1 \text{Year}_t + \theta_2 \text{Year}_t^2 + \gamma_m + \varepsilon_{mt} \quad (1)$$

where y_{mt} is the monthly tubal ligation rate in municipality m and month t (per 100,000 female residents of reproductive age). Election Year$_t$ is an indicator equal to 1 in years when municipal elections are held (i.e., in 2000 and every subsequent four years). The vector X_{mt} includes time-varying covariates such as municipal GDP per capita and the total hospitalization rate (AIH rate). Municipality fixed effects γ_m control for time-invariant characteristics of municipalities, and a quadratic time trend accounts for secular national trends in procedure rates. Ancillary analyses also include an indicator equal to 1 in years when national elections are held (i.e., in 1998 and every subsequent four years).

3.2 Electoral Cycles in Female Sterilization: Within-Year Variation

Our second empirical strategy focuses on identifying within-year cycles in the provision of tubal ligations around municipal elections. Rather than comparing average rates across election and nonelection years, we exploit the fixed timing of elections in Brazil to examine how procedure rates vary across the calendar year — specifically, whether sterilizations spike in the months leading up to an election.

We leverage a convenient feature of the Brazilian electoral system to estimate the effects of electoral cycles. In Brazil, municipal elections are held on the first Sunday of October, every four years. This institutional regularity allows us to credibly model counterfactual trends, using data from nonelection years to account for secular time trends and the seasonality of tubal ligations. We examine deviations from these underlying trends, and interpret spikes during election periods as responses to electoral incentives. We estimate:

$$y_{mt} = \sum_{k=1}^{4} \delta_k \text{Quarter}_t^k \times \text{Election Year}_t + \beta X_{mt} + \text{Year}_t + \text{Year}_t^2 + \gamma_t + \gamma_m + \varepsilon_{mt} \quad (2)$$

where y_{mt} is the outcome variable of interest, the tubal ligation rate in municipality m at in month t (per 100,000 female residents of reproductive age). In this specification, the key variables of interest are the interaction terms between calendar quarters and an indicator for whether year t is a municipal election year. Each coefficient δ_k captures the deviation in the tubal ligation rate in quarter k of an election year relative to the same quarter in nonelection years, after controlling for municipality fixed effects (γ_m), calendar month fixed effects (γ_t), time trends (Year_t and Year_t^2), and time-varying covariates X_{mt}. The coefficients δ_k thus provide an estimate of the excess provision of tubal ligations associated with municipal elections, net of seasonal and secular patterns in the outcome.

By estimating each quarter of the calendar year separately, we allow for flexible timing of effects. This design enables us to detect whether increases in sterilizations are concentrated in the months leading up to the election, consistent with strategic timing by political actors. If electoral incentives influence the provision of sterilizations, we would expect to observe a positive δ_3, as this coefficient captures additional tubal ligations performed in July, August, and September (i.e., the three months before a municipal election).

For this second empirical strategy, our primary specifications restrict analysis to municipal election years and the year immediately preceding them.[34] This restriction has two key benefits. First, it enables us to focus on the dynamics of female sterilizations around municipal elections by excluding years when national elections are held. Second, it omits the post-election year, during which new administrations take office and governance transitions may introduce changes unrelated to electoral incentives.[35] Narrowing our comparison to the year immediately preceding an election — when the same local politicians are in office and seasonality likely remains unchanged — we isolate a clean control to sharpen identification of electoral cycles in sterilization rates.

4 Results

Given the intriguing patterns observed in Figure 1 — as well as qualitative evidence of politicians using tubal ligations for political purposes — this section employs the empirical strategies described above to investigate electoral cycles in female sterilization.

4.1 Electoral Cycles in Female Sterilization: Annual Variation

In Table 1, we present estimates from several specifications based on Equation 1. As discussed above, this analysis examines annual-level variation in tubal ligation rates to discern whether municipal election years have systematically more female sterilizations. Column 1, which only controls for quadratic time trends, reveals that municipal election years are associated with significantly higher rates of tubal ligations. Specifically, the results indicate that the sterilization rate increases by 0.155, versus the monthly average rate during nonelection years of 2.1 procedures per 100,000 women of reproductive age. This finding, which is significant at the 1% level, suggests that the tubal ligation rate increases by 7.3% during election years. Column 2 shows that this estimate is nearly identical when controlling for log municipal GDP per capita, suggesting that the observed increase is not simply driven by cyclical variation in local economic activity. Column 3 includes municipality fixed effects to account for unobserved, time-invariant differences across municipalities. The estimated effect of municipal election years increases slightly to 0.171 and remains statistically significant, providing additional evidence that the pattern is not driven by systematic differences in sterilization rates across municipalities.

[Table 1 about here]

To directly compare the effects of municipal and national elections, Column 4 includes both indicators, revealing which type of election year is more strongly associated with changes in female sterilization rates. We find that the increase in tubal ligation rates during municipal election years is double that of the increase during national election years. This

specification controls for municipality fixed effects, log GDP per capita, and quadratic time trends. More specifically, the effect during municipal and national election years is 0.201 and 0.097, respectively — corresponding to 8.8% and 4.3% increases compared to the average rate during nonelection years (2.27). This pattern suggests that local politics may play a particularly important role in electoral cycles in healthcare provision.

One might be concerned that the observed increase in tubal ligations during election years merely reflects a broader rise in healthcare provision, rather than a specific increase in female sterilizations. To address this concern, Column 5 also controls for the total inpatient procedure rate (AIH rate), capturing general trends in service delivery. Taking into account the possibility that overall healthcare provision may itself respond to political cycles, conditioning on the AIH rate allows us to assess whether tubal ligations behave differently from other inpatient procedures. The results show that the effect of municipal election years remains strong and statistically significant even after accounting for broader shifts in inpatient care.[36] In contrast, the estimated effect for national election years falls substantially and is no longer statistically significant. This finding suggests that the increase in the tubal ligation rate during national election years observed in Column 4 stems from broadly higher healthcare provision in those years, rather than targeted provision of the procedure.

These results are robust to a range of alternative specifications. Recall from Section 2 that our primary specifications focus on tubal ligations performed on women residing in municipalities with a hospital and exclude surgeries during cesarean births. In Appendix Table A3, we relax these restrictions and analyze the full universe of over one million publicly provided sterilizations — that is, any procedures conducted in any municipalities. The estimated effects remain similar in magnitude and significance, indicating that results are not driven by sample selection. In addition, we replicate the analysis using the total number of tubal ligations as the dependent variable, rather than rates per 100,000 women of reproductive age. As shown in Appendix Table A4, results are robust, suggesting that findings do not depend on how the outcome is scaled.

4.2 Electoral Cycles in Female Sterilization: Within-Year Variation

Thus far, our year-level analysis reveals a systematic increase in tubal ligations performed during municipal election years. By leveraging the high granularity of data from DATASUS, we conduct more precise analyses about when sterilizations increase. In particular, we examine whether the excess provision of tubal ligations is concentrated in months immediately preceding an election, when the electoral incentives to deliver services are highest.

As discussed above, we estimate deviations from underlying seasonal and long-term trends following Equation 2. As a baseline to compare deviations during municipal election years, we employ data from the year preceding each municipal election year. These pre-election years serve as a credible control group because they are subject to the same seasonal patterns, institutional dynamics, and governance structures as municipal election years, but without immediate electoral incentives.[37] By focusing on departures from expected trends, we can detect whether the public provision of female sterilization intensifies in the months before municipal elections, as would be expected if local politicians are strategically allocating healthcare resources to influence voters.

Figure 2a compares the evolution of tubal ligation rates in years with and without municipal elections. The red dashed line illustrates the average monthly tubal ligation rate in pre-election years (i.e., when electoral incentives are muted). This red dashed line serves as a baseline for comparison purposes, shows seasonality in female sterilizations that is accounted for in regression analyses below. The blue solid line represents the average tubal ligation rate during municipal election years. For the first half of the year, both lines exhibit similar trajectories. However, beginning around July, the lines diverge: sterilization rates during election years rise, peaking in August and September — immediately before the election on the first Sunday in October — whereas rates in pre-election years remain flat. This pattern suggests a sharp increase in provision of tubal ligations aligned with the electoral calendar.

[Figure 2 about here]

We extend this graphical analysis in Figure 2b, which employs a regression framework to estimate differences in the public provision of tubal ligations.[38] As with Figure 2a, the results show that in the first half of election years, deviations from seasonal norms are small and statistically insignificant. But in the third quarter, starting in July, we see a rise in the tubal ligation rate, which persists until the election. At the peak in August, we estimate that there are 0.840 additional procedures per 100,000 women of reproductive age, corresponding to a remarkable 42.0% increase over the expected level in August absent electoral effects.

Beyond these graphical analyses, we formally quantify the effects of electoral cycles in Table 2. In particular, we implement the specification in Equation 2 described in Section 3.2. Column 1 reports estimates from a baseline specification that includes municipality fixed effects, month fixed effects, and quadratic year trends. In the first half of the year — when electoral incentives are weaker — we find no statistically significant differences between municipal election years and control years. This finding gives credence to using pre-election years as a counterfactual, as it suggests that trends in municipal election years would have plausibly remained comparable in the months leading up to the election, absent electoral incentives. By contrast, in the third quarter of municipal election years, the tubal ligation rate rises by 0.610 procedures per 100,000 women of reproductive age — a substantial increase that is significant at the 1% level. This effect corresponds to a 30.5% increase in female sterilizations, relative to the rate during the third quarter of nonelection years.

[Table 2 about here]

These findings are robust to a range of specifications. Column 2 controls for log GDP per capita to account for changes in local economic conditions; estimated coefficients are stable and remain significant. Column 3 shows that findings are similarly robust when also controlling for the total inpatient procedure rate (i.e., the AIH rate), which accounts for fluctuation in healthcare provision more broadly. To the extent that electoral cycles exist in other healthcare services (discussed below), this specification helps to isolate a differential

effect on tubal ligations, suggesting that our findings do not merely reflect a general increase in hospital activity during election periods.

As a further robustness test, Columns 4 and 5 implement year-pair fixed effects. This step addresses the possibility that quadratic year trends do not adequately capture underlying long-term trends in tubal ligations. In our analysis, a year-pair is defined as a municipal election year and the year immediately preceding it. This specification enables us to estimate differences in outcomes between municipal election years and the immediately preceding year, within each municipality. By comparing adjacent years, this approach more flexibly accounts for local time trends and mitigates the concern that functional form assumptions might drive our results. In the first two quarters of the year, we find higher female sterilization rates in municipal election years, which is consistent with the overall upward trend in procedure rates over time. Then, as with other specifications, we observe a surge in female sterilizations in the third quarter of election years.[39]

While not our primary focus, it is worth noting that in Columns 1-2 as well as Figure 2b, we observe a decrease in the tubal ligation rate in the final quarter of municipal election years. This pattern is consistent with a drop in electoral incentives following the October election, as the political returns to service provision are lower once votes have been cast. The decline in procedures during this period also reflects a broader contraction in healthcare delivery that typically follows municipal elections in Brazil. As shown in Column 3, the effect in the fourth quarter becomes small and statistically insignificant once we control for the total inpatient procedure rate, suggesting that the decline in tubal ligations is not disproportionately larger than the general post-election decrease in service provision.[40]

Stepping back, quantitative analyses suggest that female sterilizations surge during election campaigns. Employing annual variation, we observe that that female sterilizations are substantially greater during municipal election years. More rigorous analyses using within-year variation suggest that this spike in tubal ligations is concentrated in the three months just before municipal elections are held in Brazil.

4.3 Heterogeneity of Electoral Cycles

Within Brazil, in what contexts do we observe greater electoral cycles in female sterilization? The broader literature on political budget cycles suggests that politicians may be especially likely to increase their pre-election expenditures under some conditions — a phenomenon termed "conditional budget cycles."[41] For example, Shi and Svensson (2006) show that these cycles are greater in developing countries, and develop a model to explain why: they argue that cycles are less pronounced when voters are more informed, and more pronounced when politicians can more easily obtain rents from office. And to the extent that clientelism contributes to electoral cycles in female sterilization, studies also point to heterogeneity: for instance, the *quid pro quo* exchange of benefits for votes is most prevalent in developing countries, and within countries, politicians disproportionately distribute clientelist handouts to poor citizens (Hicken, 2011; Stokes et al., 2013).[42] To assess such heterogeneity, we partition the dataset and conduct regressions analogous to those above for each subgroup.[43] In Table 3, we report regression results that follow the quarterly estimation framework introduced above, and again focus on the third quarter of municipal election years — corresponding to the campaign period, when electoral incentives are strongest. All specifications include municipality and calendar month fixed effects, as well as quadratic year trends.

[Table 3 about here]

We first investigate regional heterogeneity. While clientelism and other forms of non-programmatic politics are observed across Brazil, a wide literature has emphasized their prevalence in the Northeast region of the country.[44] Poverty is especially concentrated in the Northeast region: it accounts for 27% of Brazil's population, but 44% of Brazil's poor and 55% of its extreme poor (IBGE, 2023). To explore whether electoral cycles are more amplified in Northeast Brazil, Columns 1 and 2 replicate analyses above while partitioning the dataset into tubal ligations performed within versus outside the Northeast region. Results suggest that the surge in female sterilization during elections is indeed especially pronounced

in the Northeast region, where the tubal ligation rate increases by 69.3% in the three months prior to a municipal election.[45] This increase is over four times the magnitude in other regions, which experience a 15.1% increase in procedures during the campaign period.[46] Both effects are significant at the 1% level. Whereas the Northeast region accounts for 22.9% of publicly provided female sterilizations during the study period, the region accounts for 66.8% of the total increase observed across Brazil during municipal elections. This observed regional disparity is consistent with the existing literature that suggests nonprogrammatic politics is especially rife in the Northeast region.

Given that studies on both political budget cycles and clientelism suggest that these phenomena are especially prevalent in poorer contexts, we next investigate whether electoral cycles in tubal ligations are amplified in poorer municipalities. Columns 3-5 replicate analyses above while partitioning the dataset into terciles of municipal GDP per capita.[47] As expected, effects are strongest in municipalities in the bottom income tercile: the monthly tubal ligation rate spikes by 57.8% in the third quarter of municipal election years (significant at the 1% level).[48] The middle income tercile of municipalities exhibits a smaller increase of 23.6% in the third quarter of municipal election years, while the the richest tercile exhibits a 17.8% increase (both significant at the 1% level).[49] This gradient suggests that electoral cycles in female sterilization procedures are amplified in poorer areas, consistent with theories and broader evidence about both political budget cycles and clientelism.

Beyond municipal characteristics, our dataset also provides limited information about patients, which sheds light on another key aspect of potential heterogeneity. We examine whether electoral cycles are especially pronounced for sterilizations of nonwhite women, who face significant health disparities in Brazil.[50] Among numerous reasons for examining such heterogeneity, recent quantitative research suggests that nonwhite citizens in Latin America may be disproportionately targeted with clientelist benefits during campaigns, even when controlling for their level of income (Johnson, 2020). Columns 6-7 examine this heterogeneity by partitioning the data into tubal ligations performed on white vs nonwhite women.[51] The

specifications show that in the third quarter of municipal election years, the tubal ligation rate for nonwhite women rises by 0.413 procedures per 100,000 nonwhite women of reproductive age (significant at the 1% level). By contrast, the tubal ligation rate for white women rises by a statistically insignificant 0.158 procedures per 100,000 white women of reproductive age. Because the baseline sterilization rate for nonwhite women is substantially greater than for white women, sterilizations increase by a similar percentage across race. Nevertheless, electoral cycles in female sterilization are concentrated among nonwhite Brazilians, who face substantial health disparities: a back-of-the-envelope calculation suggests that that over 80% of the excess sterilizations during election campaigns are performed on nonwhite women.[52] These racial disparities persist even when restricting the analysis to the Northeast region (see Columns 8-9).

In sum, these heterogeneity analyses suggest that electoral cycles in female sterilizations are especially amplified in poor municipalities and in the Northeast region. Moreover, electoral cycles in female sterilization are concentrated among nonwhite Brazilians, who face substantial health disparities. In the Online Appendix, we also examine temporal heterogeneity and show that electoral cycles in female sterilization are observed throughout the time period we study.[53]

4.4 Electoral Cycles in Other Hospitalizations

Do these electoral cycles in female sterilizations merely reflect broader increases in public healthcare provision during campaigns? Reassuringly, analyses above already show that findings are robust when controlling for any electoral cycles in total hospitalizations. But the question remains whether electoral cycles in tubal ligations are unique. For example, given that the literature on political budget cycles suggests that politicians often increase their provision of targetable benefits that are highly valued by voters (Brender & Drazen, 2005; Drazen & Eslava, 2010), we examine below whether similar patterns are observed for other elective surgeries with substantial unmet demand in Brazil.

Before examining other surgeries, we document the extent of electoral cycles in hospi-

talizations overall. More specifically, Column 1 of Table 4 now employs the AIH rate as a dependent variable instead of as a control variable; it reflects how many inpatient procedures were provided by the public healthcare system per 100,000 residents. As shown, we do find evidence of electoral cycles in the broader provision of healthcare, but the magnitude is quite small — in the third quarter, when electoral incentives are strongest, there is only a 0.8% increase in the overall hospitalization rate. This finding stands in sharp contrast to the 30.5% increase in tubal ligations during the same period, highlighting that while political cycles may influence general healthcare activity, female sterilizations exhibit a disproportionately large response.

[Table 4 about here]

Second, we examine whether there are electoral cycles in vasectomies. Male sterilization through vasectomies, though less invasive than female sterilization and not requiring general anesthesia, continues to be considerably less prevalent in Brazil.[54] Column 2 examines the vasectomy rate and finds substantial evidence of electoral cycles: in the third quarter of municipal election years, the rate increases by 11.7%. This effect is statistically significant at the 5% level. Nevertheless, it is deserves emphasis that the effect for female sterilizations is nearly triple in proportional terms (30.5% versus 11.7%), and even more so in absolute terms given their substantially larger baseline rate.

Third, we examine electoral cycles in the provision of other surgeries. Columns 3-5 focus on three elective procedures with the most expansive queues in Brazil's public healthcare system:[55] hernia repairs, gallbladder removals, and cataract surgeries. Although these procedures may be medically necessary, they are generally non-urgent and therefore may be especially subject to scheduling delays and rationing. We find evidence of increased provision for two of these three elective surgeries during municipal election campaigns, with statistically significant increases of 10.4% and 5.8% for hernia repairs and gallbladder removals (Columns 3 and 4, respectively). By contrast, no significant increase is observed for cataracts surgeries (Column 5). Furthermore, we examine electoral cycles in two key

nonelective surgeries (appendectomies and for heart attacks). As shown in Columns 6-7, we do not detect any increased provision of these nonelective surgeries during campaigns. These procedures require timely and often emergency care, perhaps leaving little scope for strategic manipulation by political actors.

Taken together, these results suggest that while electoral cycles in female sterilizations are especially large, similar patterns are observed for some other healthcare procedures. Elective procedures with long queues offer local officials an opportunity to deliver targetable and highly valued benefits in the months leading up to an election. By contrast, the provision of healthcare overall exhibits minimal cyclicality.

5 Conclusion

The present study explores electoral cycles in female sterilization, the most prevalent contraceptive method in the world. We focus on the case of Brazil, a country where many women have substantial unmet demands for sterilization. As our findings suggest, in this context where many eligible women wait in lengthy queues for tubal ligations, politicians distort the timing of these surgeries for electoral purposes.

Given substantial qualitative evidence of this phenomenon, we analyze a panel dataset of the universe of publicly funded tubal ligation surgeries across Brazilian municipalities in 1998-2019. Regressions demonstrate that the incidence of female sterilization increased 8.8% during municipal election years. The increase in tubal ligation surgeries is especially large during electoral campaigns: female sterilizations surged by 30.5% in the three months immediately preceding municipal elections. Findings are similar when adjusting for the overall provision of inpatient procedures, which increase less than 1% during municipal elections. Female sterilizations have more pronounced electoral cycles than do other elective surgeries with long queues (including vasectomies), and no cycles are detected when investigating emergency surgeries. Electoral cycles in female sterilization are concentrated among non-

white Brazilians and are amplified in poor municipalities, in the Northeast region, and during municipal elections.

An important avenue for future research involves the mechanisms underpinning these electoral cycles. Our findings are consistent with the broad literature on political budget cycles, which suggests various reasons why politicians across the world often increase fiscal expenditures before elections, such as signaling competence or demonstrating policy preferences (e.g., Nordhaus, 1975; Rogoff & Sibert, 1988). Yet they are also consistent with Hanusch & Keefer's (2014) argument that such cycles may stem from clientelism. A key next step is to unpack how and why Brazilian politicians increase female sterilizations during campaigns, especially given that substantial qualitative evidence — including court cases, congressional investigations and media reports — suggests that some tubal ligations are provided in *quid pro quo* exchange for votes. One possible way is examining whether women's voting behavior or political preferences render them more likely to receive sterilizations during election campaigns (ceteris paribus). For instance, research on clientelism in Brazil — which does not focus on sterilizations — suggests that Brazilians who publicly declare support during municipal campaigns (e.g., by displaying campaign flags on their homes) are more likely to receive benefits and services from politicians (Nichter, 2018). While our use of SUS data is advantageous in that it provides the universe of all publicly provided tubal ligations in Brazil, it does not allow such analyses because public health authorities do not report political information about patients. Future empirical work could fruitfully analyze individual-level survey data about women of reproductive age, or it could more extensively research whether cycles are amplified in contexts amenable to clientelism.

Another crucial direction is to investigate how such electoral cycles might affect health outcomes. Given resource scarcity, a crucial question is whether cycles in female sterilizations (as well as some other elective procedures) might affect reproductive or other health outcomes. For example, downstream health outcomes may be affected if politicians fund increased sterilizations during campaigns by rationing their provision during nonelectoral

years. And if clientelist politicians shift the profile of sterilization recipients during elections — e.g., by sterilizing women who are more willing to accept *quid pro quo* offers or whose voting compliance is easier to monitor — such reproductive health effects might disproportionately affect some subpopulations. Furthermore, another key question is whether politicians prioritize certain types of healthcare procedures that are considered more valuable as patronage (e.g., sterilizations over preventative care).[56]

Investigating such questions would shed light on the broader consequences of electoral cycles in female sterilization. Since millions of women are sterilized each year across the globe, further work should also explore whether similar electoral cycles are observed beyond Brazil. Assessing whether politicians distort the public provision of contraceptive methods is a critical task, not least because family planning is widely understood to be a basic human right.

Notes

[1]For example, see the 1968 International Conference on Human Rights, the UNFPA's "Strategy for Family Planning, 2022-2030," and the WHO website (https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception).

[2]According to the United Nations (2022), India accounts for much of the prevalence of female sterilization; the procedure's share among married contraceptive users is 59% in India, 53% in El Salvador, 48% in Mexico, 45% in the Dominican Republic, and 40% in Nicaragua. Male sterilization's share is 2% worldwide.

[3]For example, see Alonso (2020) and Patel (2017), as well as the interagency statement by the United Nations, WHO and other organizations (OCHR et al., 2014).

[4]Researchers have found strong evidence of political budget cycles in various contexts including China (Guo, 2009), Egypt (Blaydes, 2010), India (Khemani, 2004), Russia (Akhmedov & Zhuravskaya, 2004), and across Latin America (Ames, 1987). Although some studies on developed countries also identify political budget cycles (e.g., Reid, 1998; Galli & Rossi, 2002), Shi & Svensson (2006) argue that the amplitude of cycles is greater in poor countries. For excellent reviews on this topic, see Franzese (2002) or Aaskoven & Lassen (2017).

[5]Among Brazilians hospitalized in the past year, the vast majority of poorer Brazilians were hospitalized by SUS in their last visit: 95% for those earning under 1/4 the minimum salary, 90% for those earning 1/4 to 1/2 times the minimum salary, and 77% for those earning 1/2 to 1 times the minimum salary (IBGE, 2020). By contrast, the corresponding percentage was just 6.8% for Brazilians earning over 5 times the minimum salary, as wealthier citizens often employ private health plans to complement or circumvent SUS.

[6]Moreover, 84% of Brazilians who did not complete elementary school rely exclusively on SUS, versus 32% of those with university degrees.

[7]Municipal elections occur concurrently across all Brazilian municipalities; state and national elections follow two years later. Mayors can hold office for two consecutive terms (later reelection is permissible). Councilors serve as legislators at the municipal level, are elected by open-list proportional representation, and do not face term limits.

[8]By focusing on female sterilizations through December 2019, we circumvent their sharp decrease due to the COVID-19 pandemic, as well as their subsequent increase due to a 2022 legal reform. Among other changes, Law 14,443 in 2022 lowered the age requirement from 25 to 21 years, thereby substantially increasing eligibility for tubal ligations.

[9]The CFM conducted this representative survey of 2,087 Brazilians with Datafolha.

[10]Based on these data, the CFM filed a complaint with the Chamber of Deputies about long waiting lists for elective surgeries.

[11]Data on the waiting list (in June 2017) and surgeries performed (in all of 2017) in Minas Gerais are from Federal Council of Medicine (2017) and DATASUS (2025), respectively. In the city of Rio de Janeiro in 2017, 3,184 women awaited sterilizations (see "A fila do desamparo na rede municipal," *O Globo*, 1/8/2017). More systematic data on waiting lists for female sterilization are unavailable during the study period.

[12]For example, academic studies include Berquó & Cavenaghi (2003), Osis et al. (2009), Caetano (2014) and Barbosa (2018). Newsarticles include: "Fila da laqueadura dura até 2,5 anos," *Diário do Grande ABC*, 12/12/2005; "Moradora da Capital fica dois anos à espera de laqueadura," *Zero Hora*, 5/4/2015; and "A fila do desamparo na rede municipal," *O Globo*, 1/8/2017.

[13]The Ministry of Health's program description is available here: https://www.gov.br/saude/pt-br/composicao/saes/drac/pnrf.

[14]More broadly, clientelism — the contingent (*quid pro quo*) exchange of benefits for political support — has long precedent and continues in Brazil (e.g., Bobonis et al., 2022; Diniz, 1982; Hagopian, 1996; Nunes Leal, 1949; Weyland, 1996). The phenomenon is particularly rife during municipal elections, and city councilors often serve as clientelist brokers on behalf of allied mayors (Nichter, 2018).

[15]Reportagem Complica a Candidatura de um Médico em Fortaleza," *Diário do Pará*, 8/16/1990.

[16]"Prática de compra de votos é investigada em mais de mil municípios brasileiros," *Fantástico*, 8/6/2012 at https://globoplay.globo.com/v/3614370/.

[17]This message was advertised to voters in 2010 by *Movimento de Combate à Corrupção Eleitoral*, a leading umbrella network of civil society organizations against clientelism.

[18]The following newsarticle quoted ex-federal deputy Raul Jungmann (from Pernambuco in Northeast Brazil): "Transparência é mau negócio para deputados governistas," *O Estado de São Paulo*, 1/30/2011.

[19]Information in this paragraph is from the following publication: "Condenado deputado federal paraense por crime de esterilização irregular," Notícias de Supremo Tribunal Federal, 9/8/2011. This politician was convicted seven years after buying votes as a mayoral candidate, by which time he had been elected federal deputy.

[20]Information in this paragraph is from the following court decision: Tribunal Regional Eleitoral de Rondônia, Acordão No. 97 de 17/4/2008, Processo No. 88 - Classe 7.

[21]Information in this paragraph is from the following court decision: Tribunal Regional Eleitoral de Goiás, Recurso No. 5718, Protocolo 3392052008, 5/18/2009.

[22]Information in this paragraph is from the following sources: Tribunal Regional Eleitoral do Rio de Janeiro, 8/10/2012, Document No. 64-53.2010.6.19.015; "TRE-RJ Mantém Candidatura de Ex-Prefeito

Cassado em 2005," *O Globo*, 9/11/2012; and "Hospital e Investigado por Trocar Cirurgias por Votos," *Correio do Brasil*, Ano XI, Número 4300, 9/9/2010.

[23] "Hospital e Investigado por Trocar Cirurgias por Votos," *Correio do Brasil*, Ano XI, Número 4300, 9/9/2010.

[24] More specifically, his 2010 election for substitute state deputy was vacated. The candidate's brother received a monetary fine for his involvement.

[25] Information in this paragraph is from the following court decision: Tribunal Superior Eleitoral, Decisão Monocrática de 31/10/2023, Document No. 060046111.

[26] Fieldwork was conducted by the author in Bahia and Pernambuco, including 55 elite interviews in 2008-2009 and 16 elite interviews in 2012. These interviews included mayors, former mayors, city councilors, vice-mayors, party heads, and heads of social services. During the same fieldwork, similar views about a broad array of services were also frequently conveyed in interviews with 61 citizens. For example, one citizen explained: "They save part of the funds and they do it in the last year, so, one year before the election, they do everything ... to show 'I did it.'" (Author's interview in a Bahian municipality with 10,000 citizens, October 16, 2008.)

[27] Author's interview in a municipality with 10,000 citizens on November 26, 2008.

[28] Author's interview in a municipality with 30,000 citizens on December 4, 2008.

[29] "Sesau envolvida na eleição" and "Enfermeira diz que prática é antiga," *Jornal do Comercio*, 11/9/1986.

[30] Analyses below employ data on the race of patients, which is only available from 2008 onward.

[31] See the following Ministry of Health website: https://www.gov.br/saude/pt-br/sus/responsabilidades-dos-entes-que-compoem-o-sus.

[32] To identify municipalities with hospitals, we rely on data from the National Registry of Healthcare Facilities (*Cadastro Nacional de Estabelecimentos de Saúde* or CNES). We include municipalities that have at least one "General Hospital" or "Specialized Hospital," as these have the necessary surgical infrastructure to perform female sterilizations. In our data, municipalities with hospitals account for 98.9% of tubal ligations performed locally. To ensure a balanced panel, we use facility counts from 2005, the earliest year that the CNES registry is available.

[33] Another advantage of focusing on sterilizations of women who reside within the municipality involves measurement. For the denominator of our key dependent variable — the tubal ligation rate — we can employ census bureau data about the number of women of reproductive age who reside in each municipality.

[34] By contrast, our first empirical strategy above includes all years to document that electoral cycles in tubal ligation rates are stronger in municipal election years than in national election years. As an additional

robustness check, Appendix Table A2 shows that results are similar when employing year-level variation and restricting to municipal election years and the year immediately preceding them.

[35]This restriction also mitigates concerns about post-election changes in service delivery driven by new leadership. For instance, bureaucratic turnover following municipal elections has been shown to reduce healthcare provision (Toral, 2024). Including the year after elections could bias our estimates by contaminating the control group with governance-driven shifts in healthcare provision, thereby conflating post-electoral adjustments with the absence of pre-electoral strategies. Results without this restriction are presented in Table A5 of the Online Appendix and are qualitatively and quantitatively similar.

[36]As discussed in Section 4.4 below, electoral cycles in AIHs are significant but far smaller than those observed for sterilizations.

[37]To the extent that service provision in the pre-election year is also influenced by electoral considerations, the estimates reported here may represent a lower bound on the true effect.

[38]More specifically, we present estimates from a regression framework identical to Equation 2, except that we estimate monthly rather than quarterly deviations in the tubal ligation rate. As before, the specification includes municipality and calendar month fixed effects.

[39]This specification estimates the difference in the sterilization rate for a given quarter in a municipal election year relative to the same quarter in the preceding year. Unlike all previous specifications in Tables 1 and 2 that control for quadratic time trends, this approach does not adjust for projected year-on-year growth. Given the upward trajectory in tubal ligations over time (see Figure 1), for Columns 4 and 5, we expect higher rates in municipal election years than in preceding years, even without electoral incentives. Observe that when comparing the Q3 effect to the Q1 and Q2 effects, the relative difference is large and comparable in magnitude to Columns 1-3.

[40]In Table A13 of the Online Appendix, we show that this post-election drop in tubal ligations persists for approximately nine months. Figure A1 illustrates that this drop is driven by municipalities where incumbents are not reelected, consistent with evidence from Toral (2024), who documents that turnover disrupts healthcare delivery.

[41]For a literature review, see Aaskoven & Lassen (2017).

[42]Scholars have posited numerous reasons why clientelism targets the poor. Most prominently, the diminishing marginal utility of income suggests the poor place greater value on material benefits than on political preferences (Dixit & Londregan, 1996; Stokes, 2005). Researchers also point to the role of risk aversion (Desposato, 2007; Stokes et al., 2013) and time preferences (Kitschelt & Wilkinson, 2007; Scott, 1969)

[43]More specifically, we replicate Column 2 in Table 2, partitioning the dataset by the indicated subgroup.

[44]For example, see Nunes Leal (1949); Hoefle (1985); Roniger (1987); Bernal (2001); Bursztyn & Chacon (2013) and Moraes (2015).

[45]The tubal ligation rate increases by 1.382 monthly procedures per female of reproductive age, compared to a baseline rate of 1.992 during the same quarter in nonelection years.

[46]The tubal ligation rate elsewhere increases by 0.303, compared to a baseline rate of 2.001.

[47]Given that most municipalities in the Northeast region are relatively poor, this finding overlaps with the regional results reported above.

[48]In this quarter, there is a 0.956 increase in monthly tubal ligations per 100,000 women in the poorest third of municipalities — relative to the 1.652 baseline rate in the same quarter of nonelection years.

[49]As shown, there is a 0.433 (0.446) increase in monthly tubal ligations per 100,000 women in the middle (top) tercile of municipalities — relative to the 1.837 (2.508) baseline rate in nonelection years.

[50]It should be noted that DATASUS only provides information about race starting in 2008, and racial data are missing in subsequent years for approximately 40% of patients.

[51]Following the literature in Brazil, these two racial groups are based on the five categories provided by DATASUS. We use the "white" (*branca*) category in DATASUS, and aggregate the other four categories as "nonwhite": "black" (*preta*), "brown" (*parda*), "Asian" (*amarela*), and "indigenous" (*indígena*).

[52]As shown in Table A9 of the Online Appendix, in the average municipality there are an additional 0.0667 tubal ligations per month performed on nonwhite women in the third quarter of municipal election years. For white women, this figure is 0.0165 procedures per month.

[53]More specifically, Table A12 shows that findings hold both before and after 2010.

[54]"Número de laqueaduras feitas pelo SUS mostra que responsabilidade do planejamento familiar recai mais sobre a mulher," *Jornal Nacional*, 4/10/2025.

[55]"900 mil pedidos à espera de cirurgias" and "Pacientes aguardam por mais de 10 anos," *Medicina*. Volume 272, 10/2017.

[56]Previous studies suggest that clientelist politicians underprovide non-targeted benefits and over-provide targeted benefits (Keefer, 2007; Keefer & Vlaicu, 2008). Rogoff (1990) develops a model that predicts that politicians shift expenditures to goods visible to voters before elections.

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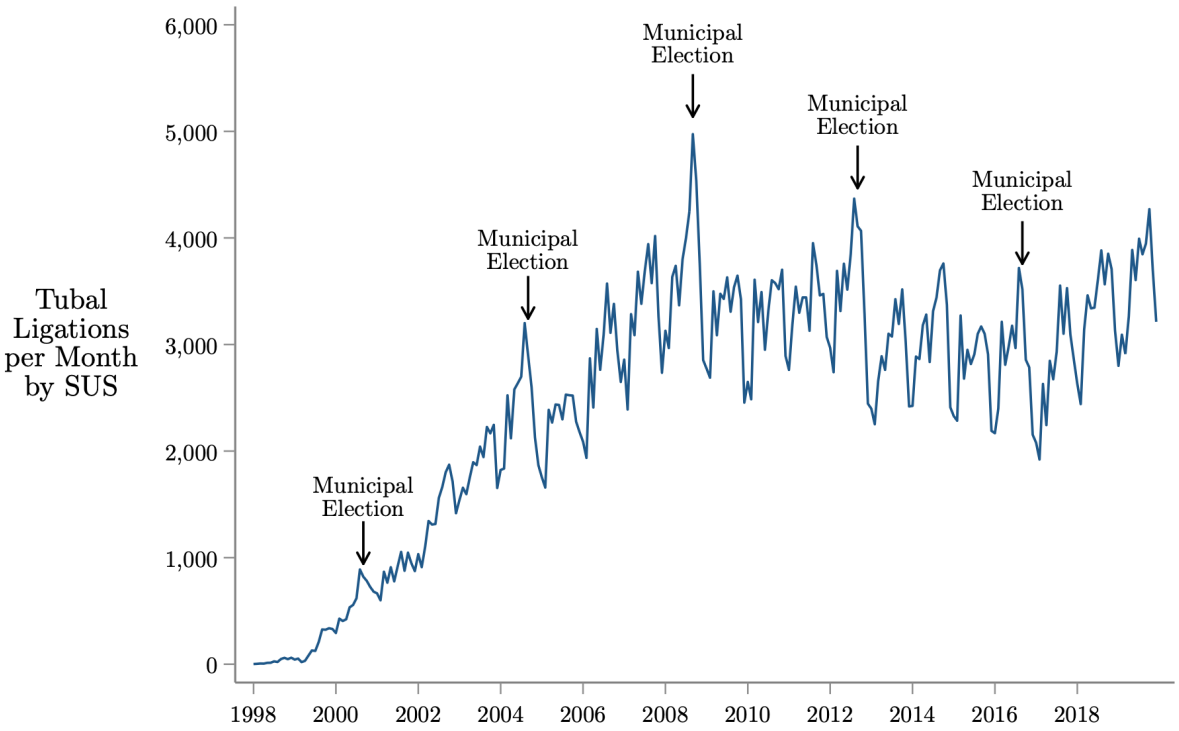
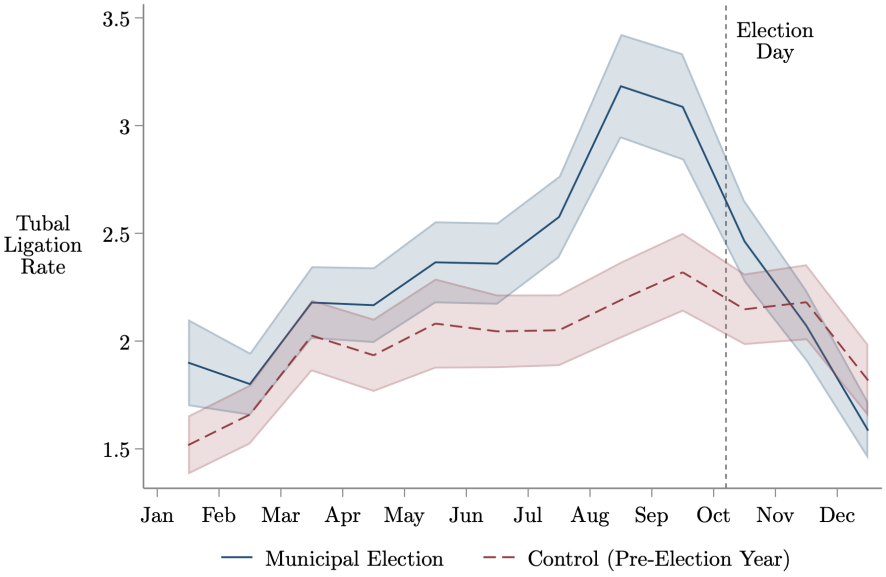
Figure 1: Tubal Ligation Procedures and the Timing of Municipal Elections



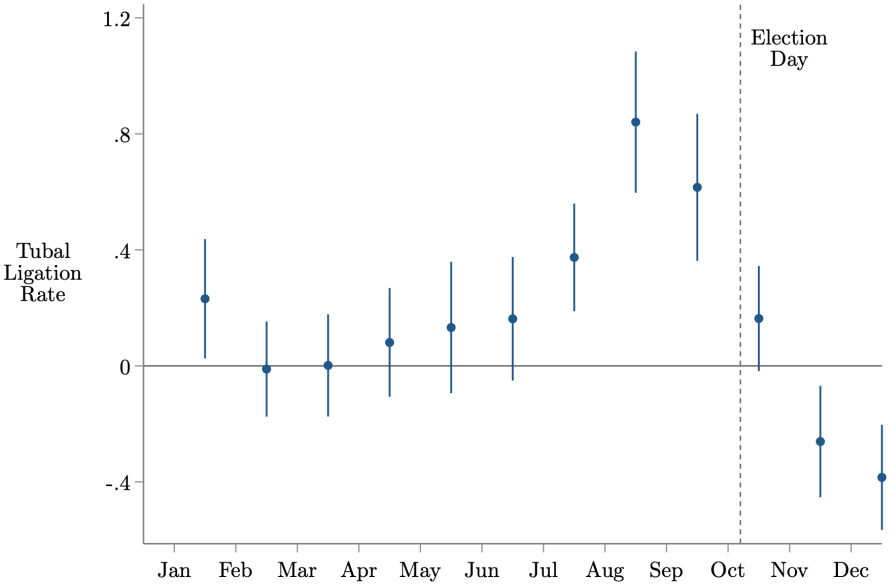
Notes: This figure shows the total number of tubal ligations performed each month through Brazil's public health system (SUS) between 1998 and 2019. Figure includes all tubal ligations, except surgeries performed during cesarean births. Municipal elections, which occur in October every 4 years, are shown.

Figure 2: Electoral Cycles in the Provision of Tubal Ligations

(a) Tubal Ligation Rates, Municipal Elections vs. Prior Year



(b) Estimated Differences in Tubal Ligation Rate



Notes: In Panel A we plot the mean monthly tubal ligation rate during municipal election years (2000, 2004, 2008, 2012, 2016; solid blue line) and the corresponding pre-election years (1999, 2003, 2007, 2011, 2015; dashed red line). Shaded regions represent 95% confidence intervals. The tubal ligation rate is defined as the number of procedures performed per 100,000 women of reproductive age (15–49) residing in the municipality. The sample is restricted to procedures performed in a patient's municipality of residence and to municipalities with at least one hospital. In Panel B, we plot deviations from underlying trends in the tubal ligation rate, estimated using a regression framework analogous to Equation 2, except with monthly rather than quarterly deviations. The specification includes municipality fixed effects and quadratic time trends. 95% confidence intervals are shown, constructed using standard errors clustered at the municipality level.

Table 1: Electoral Cycles in Tubal Ligation Rates (Year-Level Variation)

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate	(3) Tubal Ligation Rate	(4) Tubal Ligation Rate	(5) Tubal Ligation Rate
Municipal Election Year	0.155***	0.155***	0.171***	0.201***	0.228***
	(0.0461)	(0.0462)	(0.0464)	(0.0448)	(0.0451)
Log GDP per Cap.		0.729***	-0.268	-0.266	-0.192
		(0.121)	(0.269)	(0.269)	(0.263)
National Election Year				0.0966**	0.0591
				(0.0389)	(0.0387)
Total Procedure (AIH) Rate					0.00345***
					(0.000313)
Municipality FE	No	No	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes
Control Mean	2.137	2.270	2.270	2.270	2.270
Observations	792,000	755,484	755,484	755,484	755,484

Notes: This table reports estimates of the relationship between municipal election years and tubal ligation rates, as specified in Equation 1. Observations are at the municipality-month level. The outcome is the number of tubal ligations per 100,000 women of reproductive age (15–49) residing in the municipality. The sample is restricted to procedures performed in a patient's municipality of residence and to municipalities with at least one hospital. Standard errors clustered at the municipality level are shown in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Electoral Cycles in Tubal Ligation Rates (Within-Year Variation)

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate	(3) Tubal Ligation Rate	(4) Tubal Ligation Rate	(5) Tubal Ligation Rate
Municipal Election Year					
× Q1	0.0741	0.0723	0.0662	0.226***	0.238***
	(0.0665)	(0.0667)	(0.0666)	(0.0659)	(0.0699)
× Q2	0.125	0.122	0.122	0.277***	0.294***
	(0.0767)	(0.0766)	(0.0766)	(0.0750)	(0.0804)
× Q3 [Campaign]	0.610***	0.608***	0.592***	0.762***	0.764***
	(0.0904)	(0.0904)	(0.0900)	(0.0908)	(0.0954)
× Q4	-0.161**	-0.163**	-0.0812	-0.00882	0.0918
	(0.0693)	(0.0692)	(0.0696)	(0.0682)	(0.0750)
Log GDP per Cap.		-0.186	-0.121		-0.0276
		(0.290)	(0.288)		(0.290)
Total Procedure (AIH) Rate			0.00289***		0.00293***
			(0.000275)		(0.000278)
Municipality FE	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes
Year Pair FE	No	No	No	Yes	Yes
Year	Yes	Yes	Yes	No	No
Year Squared	Yes	Yes	Yes	No	No
Control Mean	1.997	1.999	1.999	1.997	1.999
Observations	360,000	359,748	359,748	360,000	359,748

Notes: This table reports coefficients from regressions of the monthly tubal ligation rate on interactions between municipal election year and calendar quarter, as specified in Equation 2. The outcome is defined as the number of tubal ligation procedures per 100,000 women of reproductive age (15–49) residing in the municipality. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. All columns include calendar month fixed effects and municipality fixed effects. Columns 1-3 include quadratic time trends, while Columns 4–5 include year-pair fixed effects, where a year pair is defined as a municipal election year and the year immediately preceding it. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Heterogeneity of Electoral Cycles in Tubal Ligation Rate (Within-Year Variation)

	(1) Northeast	(2) Other Regions	(3) Bottom Tercile Income	(4) Middle Tercile Income	(5) Top Tercile Income	(6) Nonwhite Patients	(7) White Patients	(8) Nonwhite Patients in NE	(9) White Patients in NE
Municipal Election Year									
× Q1	0.169	0.0353	0.177	0.0769	-0.0270	-0.0661	-0.123	-0.237	0.0509
	(0.130)	(0.0777)	(0.135)	(0.111)	(0.0998)	(0.116)	(0.0818)	(0.209)	(0.154)
× Q2	0.355**	0.0316	0.251**	-0.0870	0.213*	-0.0254	-0.0681	0.0603	-0.113
	(0.148)	(0.0900)	(0.127)	(0.143)	(0.129)	(0.132)	(0.106)	(0.212)	(0.187)
× Q3 [Campaign]	1.382***	0.303***	0.956***	0.433**	0.446***	0.413***	0.158	1.100***	0.325*
	(0.204)	(0.0963)	(0.172)	(0.171)	(0.121)	(0.155)	(0.111)	(0.278)	(0.196)
× Q4	-0.141	-0.170**	-0.320***	-0.00351	-0.154	-0.300**	-0.148*	-0.413**	-0.123
	(0.137)	(0.0799)	(0.106)	(0.145)	(0.105)	(0.124)	(0.0845)	(0.193)	(0.106)
Log GDP per Cap.	-0.0339	-0.160	0.522	-0.411	-0.261	-0.416	-0.194	0.130	0.395
	(0.546)	(0.350)	(0.484)	(0.571)	(0.428)	(0.447)	(0.267)	(0.706)	(0.477)
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Control Mean	1.992	2.001	1.652	1.837	2.508	2.085	1.328	1.956	0.707
Observations	102,108	257,640	120,108	119,760	119,880	144,180	144,180	40,932	40,932

Notes: This table reports coefficients from regressions of the monthly tubal ligation rate on interactions between municipal election year and calendar quarter, as specified in Equation 2. The outcome is defined as the number of tubal ligation procedures per 100,000 women of reproductive age (15–49) residing in a municipality. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. In Columns 3-6, we split the sample into terciles of GDP in 2000. Columns 6-9 restrict the analysis to 2011 onward, as we do not observe patient race in the 2007 pre-election year or earlier. We use demographic counts from the 2010 census to compute race-specific procedure rates. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Electoral Cycles in All Hospitalizations and Selected Procedures

	All	Elective				Non-Elective	
	(1) Total Procedures Rate	(2) Vasectomy Rate	(3) Hernia Rate	(4) Gallbladder Rate	(5) Cataracts Rate	(6) Appendectomy Rate	(7) Heart Attack Rate
Municipal Election Year							
× Q1	2.080*	-0.0511	0.155***	0.00547	-0.410**	-0.0239	0.0133
	(1.227)	(0.0349)	(0.0486)	(0.0339)	(0.175)	(0.0282)	(0.0197)
× Q2	0.260	-0.0158	0.189***	0.0980**	-0.638***	-0.0350	0.0345
	(1.183)	(0.0396)	(0.0510)	(0.0381)	(0.210)	(0.0277)	(0.0211)
× Q3 [Campaign]	5.484***	0.104**	0.498***	0.185***	-0.224	-0.0387	-0.0125
	(1.243)	(0.0445)	(0.0555)	(0.0392)	(0.196)	(0.0288)	(0.0210)
× Q4	-28.21***	-0.0194	-0.518***	-0.352***	-0.556***	-0.145***	-0.0421**
	(1.369)	(0.0441)	(0.0476)	(0.0362)	(0.195)	(0.0269)	(0.0194)
Log GDP per Cap.	-22.58**	-0.636***	0.0329	-0.287*	-1.679**	-0.218*	-0.221***
	(9.022)	(0.156)	(0.214)	(0.166)	(0.759)	(0.112)	(0.0779)
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Mean	660.8	0.886	4.768	3.184	2.984	2.150	1.187
Observations	359,748	359,748	359,748	359,748	359,748	359,748	359,748

Notes: This table reports coefficients from regressions of monthly inpatient procedure rates on interactions between municipal election year and calendar quarter, as specified in Equation 2. Each outcome is defined as the procedure rate per 100,000 individuals of the medically relevant population residing in the municipality. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. All columns include calendar month fixed effects, municipality fixed effects and quadratic time trends. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix

Electoral Cycles in Female Sterilization

Table A1: Summary Statistics of Inpatient Procedure Rates

	Mean	Std. Dev.	Min.	Max.
Procedure Rates for Local Residents				
Tubal Ligations	2.18	10.94	0.0	916.3
All Procedures (AIH)	660.20	253.03	0.0	8980.9
Vasectomies	1.07	6.97	0.0	716.6
Hernia Repair	4.65	8.12	0.0	340.7
Cataracts	3.05	35.14	0.0	6191.8
Gallbladder Removal	3.39	6.86	0.0	245.6
Appendectomy	2.15	4.81	0.0	186.4
Heart Attacks	1.24	3.38	0.0	187.7
Overall Procedure Rates				
Tubal Ligations	3.72	21.09	0.0	2021.9
All Procedures (AIH)	594.07	283.06	0.0	30662.7
Vasectomies	1.47	11.33	0.0	1097.2
Hernia Repair	7.65	12.31	0.0	753.0
Cataracts	9.17	55.40	0.0	10220.4
Gallbladder Removal	7.61	12.85	0.0	632.5
Appendectomy	4.35	8.81	0.0	542.2
Heart Attacks	2.30	6.31	0.0	271.1

Notes: This table reports summary statistics for monthly inpatient procedure rates at the municipality level. All rates are expressed as the number of procedures per 100,000 residents for whom the procedure is medically relevant: females aged 15–49 for tubal ligations; males aged 15–49 for vasectomies; individuals aged 55 and older for cataracts; and all residents for the remaining procedures. The "Procedure Rates for Local Residents" panel includes only patients who reside in the municipality where they received care and is limited to municipalities with hospital infrastructure. The "Overall Procedure Rates" panel includes all procedures performed in each municipality, regardless of patient residence. Observations are at the municipality-month level.

Table A2: Electoral Cycles in Tubal Ligation Rates (Year-Level Variation) — Robustness to Restriction to Municipal Election Year and Preceding Year

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate	(3) Tubal Ligation Rate	(4) Tubal Ligation Rate
Municipal Election Year	0.162***	0.168***	0.160***	0.175***
	(0.0500)	(0.0499)	(0.0500)	(0.0502)
Log GDP per Cap.		0.604***	-0.186	-0.119
		(0.122)	(0.290)	(0.288)
Total Procedure (AIH) Rate				0.00295***
				(0.000272)
Municipality FE	No	No	Yes	Yes
Year	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes
Control Mean	1.997	1.999	1.999	1.999
Observations	360,000	359,748	359,748	359,748

Notes: This table reports estimates of the relationship between municipal election years and tubal ligation rates, as specified in Equation 1. Observations are at the municipality-month level. The outcome is the number of tubal ligations per 100,000 women of reproductive age (15–49) residing in the municipality. The sample is restricted to procedures performed in a patient's municipality of residence and to municipalities with at least one hospital. Unlike our primary specifications, analysis in this table is restricted to observations during municipal election years and the years preceding them. Standard errors clustered at the municipality level are shown in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Electoral Cycles in Tubal Ligation Rates (Year-Level Variation) — Robustness to Inclusion of All Procedures and Municipalities

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate	(3) Tubal Ligation Rate	(4) Tubal Ligation Rate	(5) Tubal Ligation Rate
Municipal Election Year	0.154**	0.163**	0.191***	0.280***	0.320***
	(0.0648)	(0.0663)	(0.0661)	(0.0656)	(0.0671)
Log GDP per Cap.		1.240***	-0.841**	-0.833**	-0.674*
		(0.143)	(0.353)	(0.353)	(0.345)
National Election Year				0.286***	0.209***
				(0.0659)	(0.0670)
Total Procedure (AIH) Rate					0.00727***
					(0.00136)
					(0.00136)
Municipality FE	No	No	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes
Control Mean	5.848	6.211	6.211	6.211	6.211
Observations	1,453,848	1,386,996	1,386,996	1,386,996	1,386,996

Notes: This table reports estimates of the relationship between municipal election years and tubal ligation rates, as specified in Equation 1. Observations are at the municipality-month level. The outcome is the number of tubal ligations per 100,000 women of reproductive age (15–49) residing in the municipality. Analysis in this table includes all procedures in all municipalities; compared to our primary specifications, it also includes procedures performed outside of a patient's municipality of residence, and those tubal ligations performed during a cesarean delivery. Standard errors clustered at the municipality level are shown in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Electoral Cycles in Tubal Ligations (Year-Level Variation) — Results in Levels

	(1) Num. of Tubal Ligations	(2) Num. of Tubal Ligations	(3) Num. of Tubal Ligations	(4) Num. of Tubal Ligations	(5) Num. of Tubal Ligations
Municipal Election Year	0.0343***	0.0245*	0.0400***	0.0443***	0.0601***
	(0.0117)	(0.0127)	(0.0114)	(0.0106)	(0.0138)
Log GDP per Cap.		0.745***	-0.215**	-0.214**	-0.116*
		(0.195)	(0.104)	(0.104)	(0.0646)
National Election Year				0.0138	-0.00606
				(0.00887)	(0.0122)
Total Procedures (AIH)					0.00822*
					(0.00436)
					(0.00436)
Municipality FE	No	No	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes
Control Mean	0.621	0.660	0.660	0.660	0.660
Observations	793,584	756,852	756,852	756,852	756,852

Notes: This table reports estimates of the relationship between municipal election years and tubal ligations (in levels not rates), as specified in Equation 1. Observations are at the municipality-month level. The dependent variable is defined as the number of tubal ligations performed residents of a municipality in a given month. The sample is restricted to procedures performed in a patient's municipality of residence and to municipalities with at least one hospital. Standard errors clustered at the municipality level are shown in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Electoral Cycles in Tubal Ligation Rates — Robustness to Inclusion of Post-Election Year

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate	(3) Tubal Ligation Rate
Municipal Election Year			
× Q1	0.301***	0.303***	0.274***
	(0.0571)	(0.0571)	(0.0565)
× Q2	0.239***	0.240***	0.246***
	(0.0653)	(0.0655)	(0.0656)
× Q3 [Campaign]	0.637***	0.639***	0.639***
	(0.0838)	(0.0841)	(0.0840)
× Q4	-0.141**	-0.140**	-0.0407
	(0.0629)	(0.0632)	(0.0639)
Log GDP per Cap.		-0.174	-0.114
		(0.249)	(0.247)
Total Procedures (AIH) Rate			0.00290***
			(0.000255)
Municipality FE	Yes	Yes	Yes
Month FE	Yes	Yes	Yes
Year	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes
Control Mean	2.035	2.036	2.036
Observations	540,000	539,628	539,628

Notes: This table reports coefficients from regressions of the monthly tubal ligation rate on interactions between municipal election year and calendar quarter, as specified in Equation 2. The outcome is defined as the number of tubal ligation procedures per 100,000 women of reproductive age (15–49) residing in a municipality. Unlike our primary specifications, analysis in this table includes observations from the year following municipal elections. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative nonelection years (those preceding and following municipal elections). All columns include calendar month fixed effects and municipality fixed effects. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Electoral Cycles in Tubal Ligation Rates (Within-Year Variation) — Robustness to Inclusion of All Procedures and Municipalities

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate	(3) Tubal Ligation Rate	(4) Tubal Ligation Rate	(5) Tubal Ligation Rate
Municipal Election Year					
× Q1	0.180	0.176	0.168	0.709***	0.731***
	(0.115)	(0.115)	(0.115)	(0.116)	(0.118)
× Q2	0.274**	0.272*	0.266*	0.803***	0.829***
	(0.139)	(0.140)	(0.139)	(0.140)	(0.143)
× Q3 [Campaign]	0.493***	0.490***	0.447***	1.023***	1.010***
	(0.127)	(0.127)	(0.127)	(0.127)	(0.131)
× Q4	-0.444***	-0.449***	-0.328**	0.0847	0.236*
	(0.123)	(0.123)	(0.128)	(0.122)	(0.131)
Log GDP per Cap.		-0.376	-0.221		-0.141
		(0.359)	(0.358)		(0.357)
Total Procedure (AIH) Rate			0.00548***		0.00552***
			(0.00155)		(0.00156)
Municipality FE	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes
Year Pair FE	No	No	No	Yes	Yes
Year	Yes	Yes	Yes	No	No
Year Squared	Yes	Yes	Yes	No	No
Control Mean	5.035	5.034	5.034	5.035	5.034
Observations	660,840	660,468	660,468	660,840	660,468

Notes: This table reports coefficients from regressions of the monthly tubal ligation rate on interactions between municipal election year and calendar quarter, as specified in Equation 2. The outcome is defined as the number of tubal ligation procedures per 100,000 women of reproductive age (15–49) residing in the municipality. Analysis in this table includes all procedures in all municipalities; compared to our primary specifications, it also includes procedures performed outside of a patient's municipality of residence, and those tubal ligations performed during a cesarean delivery. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. All columns include calendar month fixed effects and municipality fixed effects. Columns 1-3 include quadratic time trends, while Columns 4–5 include year-pair fixed effects, where a year pair is defined as a municipal election year and the year immediately preceding it. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Electoral Cycles in Tubal Ligations (Within-Year Variation) Procedure — Results in Levels

	(1) Num. of Tubal Ligations	(2) Num. of Tubal Ligations	(3) Num. of Tubal Ligations	(4) Num. of Tubal Ligations	(5) Num. of Tubal Ligations
Municipal Election Year					
× Q1	0.0198	0.0177	0.0188	0.0565***	0.0795***
	(0.0140)	(0.0143)	(0.0140)	(0.0132)	(0.0190)
× Q2	0.0496***	0.0473***	0.0578***	0.0864***	0.118***
	(0.0170)	(0.0171)	(0.0182)	(0.0168)	(0.0254)
× Q3 [Campaign]	0.114***	0.112***	0.110***	0.151***	0.170***
	(0.0195)	(0.0194)	(0.0199)	(0.0208)	(0.0259)
× Q4	0.00494	0.00278	0.0439	0.0417**	0.105**
	(0.0142)	(0.0141)	(0.0328)	(0.0174)	(0.0430)
Log GDP per Cap.		-0.215*	-0.158*		-0.131
		(0.118)	(0.0829)		(0.0822)
Total Procedures (AIH)			0.00795		0.00795
			(0.00497)		(0.00497)
Municipality FE	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes
Year Pair FE	No	No	No	Yes	Yes
Year	Yes	Yes	Yes	No	No
Year Squared	Yes	Yes	Yes	No	No
Control Mean	0.596	0.596	0.596	0.596	0.596
Observations	360,720	360,324	360,324	360,720	360,324

Notes: This table reports coefficients from regressions of monthly tubal ligation procedures (in levels not rates) on interactions between municipal election year and calendar quarter, as specified in Equation 2. The dependent variable is defined as the number of tubal ligations performed for residents of a municipality in a given month. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. All columns include calendar month fixed effects and municipality fixed effects. Columns 1-3 include quadratic time trends, while Columns 4–5 include year-pair fixed effects, where a year pair is defined as a municipal election year and the year immediately preceding it. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Heterogeneity of Electoral Cycles in Tubal Ligation Rate (Within-Year Variation) — Robustness to Inclusion of All Procedures and Municipalities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Northeast	Other Regions	Bottom Tercile Income	Middle Tercile Income	Top Tercile Income	Non-White Patients	White Patients	Non-White Patients in NE	White Patients in NE
Municipal Election Year									
× Q1	0.422**	0.0633	0.620***	-0.0215	-0.0549	-0.236	-0.189	0.338	-0.0451
	(0.181)	(0.147)	(0.206)	(0.234)	(0.154)	(0.291)	(0.190)	(0.345)	(0.284)
× Q2	1.096***	-0.118	0.869***	0.0928	-0.130	-0.427	-0.264	0.735**	0.315
	(0.228)	(0.175)	(0.264)	(0.281)	(0.164)	(0.306)	(0.209)	(0.372)	(0.255)
× Q3 [Campaign]	1.870***	-0.168	1.133***	0.244	0.108	0.393	-0.374	1.956***	0.691**
	(0.219)	(0.154)	(0.237)	(0.250)	(0.161)	(0.294)	(0.258)	(0.398)	(0.334)
× Q4	-0.472**	-0.433***	-0.810***	-0.331	-0.184	-0.852***	0.0139	-0.421	-0.118
	(0.183)	(0.160)	(0.222)	(0.245)	(0.165)	(0.273)	(0.191)	(0.329)	(0.244)
Log GDP per Cap.	0.303	-0.452	1.856**	-0.619	-1.876***	0.456	-1.485**	2.967*	-2.820**
	(0.736)	(0.414)	(0.806)	(0.605)	(0.452)	(0.783)	(0.628)	(1.672)	(1.391)
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Control Mean	4.413	5.333	4.586	5.154	5.367	6.278	4.326	5.455	1.985
Observations	214,428	446,040	221,628	218,520	220,320	266,964	266,964	86,100	86,100

Notes: This table reports coefficients from regressions of the monthly tubal ligation rate on interactions between municipal election year and calendar quarter, as specified in Equation 2. The outcome is defined as the number of tubal ligation procedures per 100,000 women of reproductive age (15–49) residing in the municipality. Analysis in this table includes all procedures in all municipalities; compared to our primary specifications, it also includes procedures performed outside of a patient's municipality of residence, and those tubal ligations performed during a cesarean delivery. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. In Columns 3-6, we split the sample into terciles of GDP in 2000. Columns 6-9 restrict the analysis to 2011 onward, as we do not observe patient race in the 2007 pre-election year or earlier. We use demographic counts from the 2010 census to compute race-specific procedure rates. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$..

Table A9: Heterogeneity of Electoral Cycles in Tubal Ligations (Within-Year Variation) — Results in Levels

	(1) Northeast	(2) Other Regions	(3) Bottom Tercile Income	(4) Middle Tercile Income	(5) Top Tercile Income	(6) Non-White Patients	(7) White Patients	(8) Non-White Patients in NE	(9) White Patients in NE
Municipal Election Year									
× Q1	0.0465*	0.00676	0.0157	0.0394**	0.00220	0.00999	-0.0196*	0.0524	0.00421
	(0.0276)	(0.0165)	(0.0151)	(0.0196)	(0.0343)	(0.0169)	(0.0109)	(0.0333)	(0.00912)
× Q2	0.0844**	0.0331*	0.0458*	0.0370	0.0634*	0.0222	0.00689	0.0520*	-0.00184
	(0.0356)	(0.0193)	(0.0250)	(0.0257)	(0.0367)	(0.0151)	(0.0120)	(0.0298)	(0.00836)
× Q3 [Campaign]	0.265***	0.0525***	0.130***	0.128***	0.0830**	0.0667***	0.0165	0.164***	0.0236**
	(0.0481)	(0.0193)	(0.0301)	(0.0345)	(0.0362)	(0.0194)	(0.0125)	(0.0404)	(0.0103)
× Q4	0.0328	-0.00862	-0.0244*	0.0162	0.0208	-0.00549	0.00101	-0.0217	-0.00146
	(0.0251)	(0.0171)	(0.0131)	(0.0192)	(0.0357)	(0.0188)	(0.00985)	(0.0235)	(0.00575)
Log GDP per Cap.	-0.146	-0.213	0.0238	-0.0162	-0.297	0.107	0.0405	0.221*	0.00352
	(0.149)	(0.138)	(0.0577)	(0.0862)	(0.278)	(0.0721)	(0.0447)	(0.129)	(0.0236)
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Control Mean	0.463	0.649	0.198	0.321	1.271	0.310	0.209	0.299	0.0468
Observations	102,300	258,024	120,204	120,048	120,072	144,180	144,180	40,932	40,932

Notes: This table reports coefficients from regressions of monthly tubal ligation procedures (in levels not rates) on interactions between municipal election year and calendar quarter, as specified in Equation 2. The dependent variable is defined as the number of tubal ligations performed for residents of a municipality in a given month. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. In Columns 3-6, we split the sample into terciles of GDP in 2000. Columns 6-9 restrict the analysis to 2011 onward, as we do not observe patient race in the 2007 pre-election year or earlier. We use demographic counts from the 2010 census to compute race-specific procedure rates. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10: Electoral Cycles in All Hospitalizations and Selected Procedures — Robustness to Inclusion of All Procedures and Municipalities

	All	Elective				Non-Elective	
	(1) Total Procedures Rate	(2) Vasectomy Rate	(3) Hernia Rate	(4) Gallbladder Rate	(5) Cataracts Rate	(6) Appendectomy Rate	(7) Heart Attack Rate
Municipal Election Year							
× Q1	1.439	0.0470	0.151**	-0.0301	-1.209***	0.0220	0.0506*
	(1.419)	(0.0453)	(0.0613)	(0.0583)	(0.217)	(0.0428)	(0.0300)
× Q2	1.154	-0.0629	0.293***	0.283***	-1.496***	-0.0372	0.0780**
	(1.422)	(0.0464)	(0.0658)	(0.0632)	(0.226)	(0.0414)	(0.0303)
× Q3 [Campaign]	7.853***	-0.00583	0.772***	0.244***	-0.306	0.0886**	-0.0289
	(1.058)	(0.0496)	(0.0649)	(0.0620)	(0.244)	(0.0416)	(0.0304)
× Q4	-22.14***	-0.0857*	-0.723***	-0.725***	-1.701***	-0.102**	-0.0239
	(1.066)	(0.0512)	(0.0573)	(0.0586)	(0.215)	(0.0407)	(0.0299)
Log GDP per Cap.	-28.24***	-0.463***	-0.130	-0.310**	-1.234	-0.207**	-0.121**
	(5.809)	(0.119)	(0.144)	(0.132)	(0.910)	(0.0865)	(0.0607)
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Mean	591.9	1.207	7.626	6.984	8.704	4.089	2.136
Observations	660,468	660,468	660,468	660,468	660,468	660,468	660,468

Notes: This table reports coefficients from regressions of monthly procedure rates on interactions between municipal election year and calendar quarter, as specified in Equation 2. Analysis in this table includes all procedures in all municipalities; compared to our primary specifications, it also includes procedures performed outside of a patient's municipality of residence. Each outcome is defined as the procedure rate per 100,000 individuals of the medically relevant population residing in a municipality. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. All columns include calendar month fixed effects, municipality fixed effects and quadratic time trends. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: Electoral Cycles in All Hospitalizations and Selected Procedures — Results in Levels

	All	Elective				Non-Elective	
	(1) Total Procedures	(2) Vasectomy	(3) Hernia	(4) Gallbladder	(5) Cataracts	(6) Appendectomy	(7) Heart Attack
Municipal Election Year							
× Q1	-0.144	0.00625	0.0586***	-0.0161	-0.114***	-0.0457***	0.00642
	(0.600)	(0.0159)	(0.0185)	(0.0207)	(0.0395)	(0.0160)	(0.00888)
× Q2	-1.323**	0.00182	0.103***	0.0165	-0.193***	-0.0195	0.00854
	(0.543)	(0.0149)	(0.0216)	(0.0219)	(0.0628)	(0.0129)	(0.0102)
× Q3 [Campaign]	0.313	0.0282*	0.197***	0.0625***	-0.0779**	-0.0177	-0.0154
	(0.643)	(0.0153)	(0.0257)	(0.0212)	(0.0375)	(0.0116)	(0.00980)
× Q4	-5.173***	-0.0130	-0.0395	-0.117***	-0.0750***	-0.0220*	-0.0152
	(0.489)	(0.0152)	(0.0284)	(0.0217)	(0.0207)	(0.0115)	(0.0101)
Log GDP per Cap.	-7.134	-0.376**	0.201*	-0.606***	-0.0547	-0.358***	-0.305**
	(6.592)	(0.162)	(0.122)	(0.176)	(0.177)	(0.137)	(0.119)
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Mean	284.0	0.382	2.782	2.619	0.614	1.666	0.985
Observations	360,324	360,324	360,324	360,324	360,324	360,324	360,324

Notes: This table reports coefficients from regressions of monthly procedure counts (not rates) on interactions between municipal election year and calendar quarter, as specified in Equation 2. Each dependent variable is defined as the number of procedures performed for residents of the municipality in a given month. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to years preceding municipal elections. All columns include calendar month fixed effects, municipality fixed effects and quadratic time trends. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A12: Electoral Cycles in Tubal Ligations — First vs. Second Half of Sample Years

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate
Municipal Election Year × Pre-2010		
× Q1	0.0562	0.0519
	(0.0770)	(0.0769)
× Q2	0.0765	0.0722
	(0.0960)	(0.0958)
× Q3 [Campaign]	0.511***	0.507***
	(0.113)	(0.113)
× Q4	0.0181	0.0139
	(0.0829)	(0.0827)
Municipal Election Year × Post-2010		
× Q1	0.100	0.103
	(0.112)	(0.112)
× Q2	0.198*	0.198*
	(0.116)	(0.116)
× Q3 [Campaign]	0.759***	0.760***
	(0.140)	(0.140)
× Q4	-0.430***	-0.428***
	(0.108)	(0.108)
Log GDP per Cap.		-0.186
		(0.290)
Municipality FE	Yes	Yes
Month FE	Yes	Yes
Year	Yes	Yes
Year Squared	Yes	Yes
Control Mean Pre-2010	1.403	1.404
Control Mean Post-2010	2.889	2.891
Obs.	360,000	359,748

Notes: This table reports coefficients from regressions of the monthly tubal ligation rate on interactions between municipal election year, calendar quarter, and a post-2010 indicator. The outcome is defined as the number of tubal ligation procedures per 100,000 women of reproductive age (15–49) residing in a municipality. Each coefficient captures deviations from underlying trends in the specified quarter of a municipal election year, relative to nonelection years, separately for 1998-2009 and 2010-2019. All columns include calendar month and municipality fixed effects, as well as a quadratic time trend. Column 2 additionally controls for log municipal GDP per capita. Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

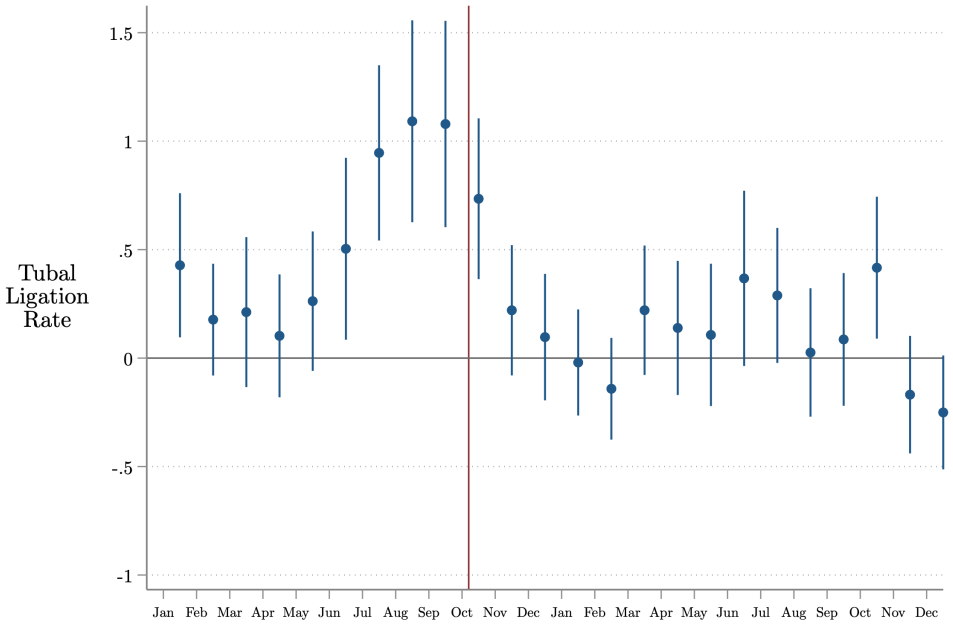
Table A13: Electoral Cycles in Tubal Ligation Rates — Quarterly Effects Over a 24-Month Window

	(1) Tubal Ligation Rate	(2) Tubal Ligation Rate	(3) Tubal Ligation Rate
Mun. Election Year × Q1	0.0664	0.0641	0.0576
	(0.0662)	(0.0664)	(0.0663)
× Q2	0.118	0.114	0.113
	(0.0763)	(0.0763)	(0.0763)
× Q3 [Campaign]	0.602***	0.600***	0.584***
	(0.0901)	(0.0900)	(0.0896)
× Q4	-0.168**	-0.171**	-0.0896
	(0.0690)	(0.0690)	(0.0692)
Post-Election Year × Q1	-0.468***	-0.478***	-0.435***
	(0.0613)	(0.0616)	(0.0613)
× Q2	-0.243***	-0.253***	-0.267***
	(0.0762)	(0.0769)	(0.0769)
× Q3	-0.0688	-0.0780	-0.112
	(0.0684)	(0.0697)	(0.0697)
× Q4	-0.0539	-0.0629	-0.0984
	(0.0746)	(0.0764)	(0.0765)
Log GDP per Cap.		-0.218	-0.160
		(0.251)	(0.249)
AIH Rate			0.00290***
			(0.000255)
Municipality FE	Yes	Yes	Yes
Calendar Month FE	Yes	Yes	Yes
Year	Yes	Yes	Yes
Year Squared	Yes	Yes	Yes
Control Mean	2.035	2.036	2.036
Obs.	540000	539628	539628

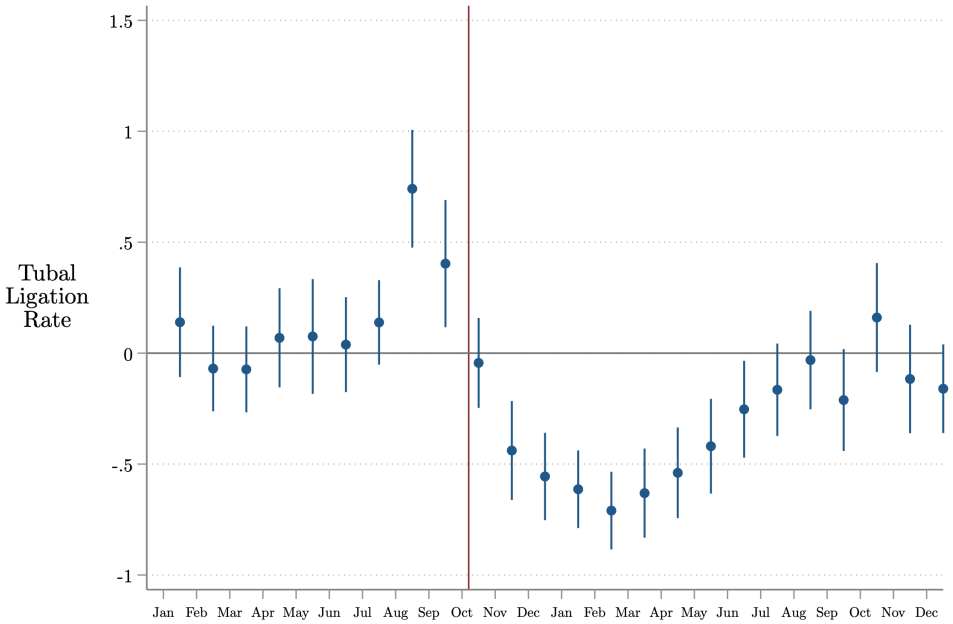
Notes: This table reports coefficients from regressions of the monthly tubal ligation rate on indicators for quarters of the municipal election year and the four quarters of the post-municipal election year. The outcome is defined as the number of tubal ligation procedures per 100,000 women of reproductive age (15–49) residing in the municipality. Coefficients represent deviations in each quarter of the election and post-election years, relative to nonelection years. All columns include municipality and calendar month fixed effects, as well as a quadratic time trend. Column 2 controls for log municipal GDP per capita, and Column 3 additionally controls for the total hospitalization rate (AIH rate). Standard errors clustered at the municipality level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure A1: Electoral Cycle in Tubal Ligation Rates, by Mayoral Turnover

(a) Mayor Reelected



(b) Mayoral Turnover



Notes: In this figure we plot deviations from underlying trends in the tubal ligation rate. In Panel A, we estimate these deviations in municipalities where incumbent mayors are reelected, while Panel B shows deviations from municipalities that experience mayoral turnover. These deviations are estimated using a regression framework analogous to Equation 2, except with monthly rather than quarterly deviations. We include the years following municipal elections in this figure. The specification includes municipality fixed effects and quadratic time trends. 95% confidence intervals are shown, constructed using standard errors clustered at the municipality level.