



## Regular article

Fighting violence against women: The role of female political representation<sup>☆</sup>Alena Bochenkova<sup>a</sup>, Paolo Buonanno<sup>a,\*</sup>, Sergio Galletta<sup>b</sup><sup>a</sup> University of Bergamo, Italy<sup>b</sup> ETH Zürich, Switzerland

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## ABSTRACT

We investigate the effect of women's political leadership in local government on domestic violence against women. Using a regression discontinuity design, we compare Brazilian municipalities where a female candidate barely won to those where a female candidate barely lost mayoral elections. We find that the presence of a female mayor leads to a 50% average reduction in both the homicide rate and violence against women over a four-year term. These results are not attributable to pre-existing municipal characteristics or other observable mayor attributes. Collectively, our findings offer compelling evidence that women in office play a significant role in effectively addressing violence against women.

## 1. Introduction

There is a growing body of academic research studying the effect of female political representation on policy decisions and outcomes suggesting that female policymakers are more socially oriented than male ones (Hessami and da Fonseca, 2020; Brollo and Troiano, 2016; Lippmann, 2022; Bruce et al., 2022). In this paper, we provide evidence of the effect of female political representation on domestic violence. In particular, we analyze whether the gender of the policymaker affects violence against women (i.e., femicide, physical violence, psychological violence and sexual violence) by focusing on mixed-gender electoral races in Brazilian municipalities.

As emphasized by the United Nations in its sustainable development goal, “eliminating all forms of violence against all women and girls in the public and private spheres” is a crucial objective to achieve gender equality and empower all women and girls. Official statistics provide a clear picture of this global tragedy. One in three women worldwide experience physical or sexual violence affecting both women's well-being and their participation in society and politics.<sup>1</sup> Moreover, more

than 50% of homicides with female victims are perpetrated by intimate partners or other family members.<sup>2</sup> Despite being a global issue, violence against women is much more prevalent in low and lower-middle income countries and regions, forcing many countries to adopt specific legislation to criminalize femicide and gender-based violence. For instance in Brazil, according to official statistics, a woman is killed every two hours and assaulted every 15 s (Cerqueira and Bueno, 2020).

Over the past few decades, the share of women in politics has significantly increased in almost every country, shaping social and economic policy (Hessami and da Fonseca, 2020; Andreoli et al., 2021). Several empirical and experimental studies have documented that female empowerment and political representation affect policy decisions and outcomes, favoring social policies and interventions and reducing corruption and bribing (Chattopadhyay and Duflo, 2004; Brollo and Troiano, 2016; Eckel and Grossman, 2008). More limited is the evidence about the impact of female representation on crimes, and more specifically how it can affect crime against women. Theoretically, one can expect female representatives to influence violence against women via a number of mechanisms. First, female politicians could favor policies that deter violence and increase awareness about this

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<sup>1</sup> According to the UN 736 million women (roughly 30%) have been subjected to physical and/or sexual violence at least once in their life (World Health Organization, 2013).

<sup>2</sup> In 2017, according to the United Nations Office on Drugs and Crime (UNODC), 87,000 women were intentionally killed.

issue. Second, the presence of female leaders could directly affect crime through a “role-model” effect. Third, law enforcement could become more sympathetic towards female victims (e.g., attitudes or incentives). Finally, female officials might differ in their policy preferences in building a peaceful and equitable society: having a less adverse environment could give female victims greater self-confidence and a lower tolerance for being badly treated.

Identifying the causal effects of female leaders on violence is challenging because there could be municipality characteristics that correlate with the likelihood of having a female leader and violence against women. Therefore, we apply a regression discontinuity (RD) design focusing on close elections in Brazilian municipalities (2004–2016), assuming that municipalities where a female candidate won against a man by a narrow margin represent a good counterfactual for those municipalities where the opposite occurred (i.e., a male candidate won against a woman by a narrow margin) (Barbosa, 2017; Lee et al., 2004).

We find that the presence of a female mayor in Brazilian municipalities is associated with a significant and sizable reduction in domestic violence against women of relevant age (between 15 and 49) over the 4-year term: around 50% reduction for both femicide and other measures of violence against women (physical violence, psychological violence, sexual violence). Furthermore, our analysis revealed a reduction in total violence (including non-domestic violence) but did not observe an impact on the total number of homicides. Our results are robust to the inclusion of standard controls and to several validation and falsification tests. In particular, we do not find an effect on violent crime against men, general mortality, the motor vehicle accident fatality rate, and the suicide rate for both males and females, separately. It is worth stressing, that by using the number of murders as one of the proxy for violence helps in addressing issues of under-reporting which might be present for less extreme acts of violence.<sup>3</sup> To clearly identify the mechanisms that explain such results is challenging. From existing evidence and some novel results we suggest that female mayors have an increased attention to policies that might favor women welfare, however we do not find clear evidence that female mayors are more likely than men to introduce women’s shelter or women police stations, policies that are managed and implemented by state governors.

Our paper mainly contributes to two strands of the literature studying the effect of women’s leadership on (i) policy outcomes and (ii) on women’s welfare outcomes. While evidence shows that women are consistently less corrupt than men across distinct contexts and countries (Decarolis et al., 2022; Brollo and Troiano, 2016; Afridi et al., 2017; Jha and Sarangi, 2018; Baskaran et al., 2018), women’s leadership improved policy outcomes in contexts such as education and health provision (Chattopadhyay and Duflo, 2004; Clots-Figueras, 2012; Bhalotra and Clots-Figueras, 2014; Bruce et al., 2022) but had no clear effect on public spending (Bagues and Campa, 2021; Ferreira and Gyourko, 2014; Baltrunaite et al., 2019).<sup>4</sup> Despite the growing body of research documents how female leadership impacts policy outcomes, less is known about its impacts on women’s welfare outcomes, especially whether improving female representation decreases gender violence. The closest paper to our analysis is Iyer et al. (2012) that find that an increase in female representation in local government induces a large and significant rise in documented crimes against women in India, reflecting improvements in reporting rather than a rise in actual crimes.

Thus, we complement the related literature by providing one of the first evidence that there is a link between female political representation and reduced femicide and violence against women. The

closest results to our paper are from a simultaneous work by Delaporte and Pino (2022). This study, similar to ours, focuses on the effect of female mayors on gender violence in Brazil. The two papers share many results, however, the main difference is that while Delaporte and Pino (2022) primarily examines violence against women, we focus on women homicide rates. Our approach prioritizes the lower likelihood of measurement errors compared to reporting on violence in general. Yet, Delaporte and Pino (2022) also provide in their additional analysis section estimates that use the homicide rate as a dependent variable to validate their primary evidence. The results are qualitatively consistent with what is reported in our paper (i.e., an effect of domestic homicide and no effect on total homicide). Importantly, we account for an additional election term compared to Delaporte and Pino (2022) analysis, allowing for a more robust test on the potential pre-existing difference in violence against women before the election of a female mayor. In other words, we formally test the crucial assumption that the gender of an elected mayor is not systematically correlated with the pre-existing level of violence against women.

The paper proceeds as follows. Section 2 provides institutional details. Sections 3 and 4 describe our data and empirical strategy, respectively. Section 5 presents our results and discusses the possible mechanisms at play. Section 7 concludes.

## 2. Institutional background

### 2.1. Violence in Brazil

Like other countries in Latin America, Brazil has a high level of violence against women. This is a long-term and persistent phenomenon that has gained attention only in recent years thanks to the efforts of women’s activists and politicians, who have pushed forward several specific legislative reforms to criminalize femicide and gender-based violence. For example, in 2006, Brazilian legislators passed Law no. 11.340 (known as the “Maria da Penha” Law on Domestic and Family Violence), which establishes criminal sanctions for perpetrators of domestic violence against women and domestic violence courts. However, it also requires Brazilian authorities to protect and assist the victims of violence through special police bodies and stations and shelters for women. In the following years, there were additional initiatives and further legislation was approved. For instance, in 2013 the “Mulher, Viver sem Violência” was promoted. It aimed to improve public policies in favor of female victims of violence. 2015 saw the enactment of the femicide Law, which changed the Brazilian Penal Code by including femicide as a qualifier for the crime of homicide.

Despite these efforts to combat violence against women, there were no substantial changes to the overall level of violence.<sup>5</sup> For example, the female homicide rate (FHR) was 4.2 per hundred thousand in 2018, slightly decreasing from the previous 15 years in which the average homicide rate was about 4.3. Looking at the geographical distribution, we can see that the most violent states in 2018 are Roraima (FHR = 18.8), Ceará (FHR = 10.2) and Acre (FHR = 8.0), while the least violent are São Paulo (FHR = 1.9), Santa Catarina (FHR = 2.6) and Piauí (FHR = 3.1). The heterogeneity in the level of violence across municipalities is quite significant, as demonstrated by the fact that, in 2018, around 75% of municipalities did not have any cases of female homicides in their territory, while in those municipalities with at least one case, the FHR ranges between almost 0 and more than 100, with an average of 13.4.

Our empirical analysis aims to highlight whether the gender of the local political leader could partly explain this cross-sectional heterogeneity.

<sup>3</sup> Iyer et al. (2012) show that higher female representation increases the reporting of crimes against women, not actual crime, in which case our estimates are potentially downward bias.

<sup>4</sup> Hessami and da Fonseca (2020) provides a systematic review of recent literature on the substantive effects of female representation on policies.

<sup>5</sup> It is worth pointing out that we are not suggesting that these laws were not effective, as it might be the case that violence would have increased in the absence of the reforms.

## 2.2. Local politics

Brazil is a federal republic governed under a presidential system, with a national government, 26 states, and 5570 municipalities. Each municipality has an autonomous local government comprising a mayor (prefeito) and a legislative body (câmara municipal). Local governments are responsible for providing several local public goods (e.g., primary education, culture, health care, housing, transportation, and municipal infrastructure). The mayor plays a central role in defining the expenditure programs, while the city council is responsible for enacting municipal laws and overseeing the mayor's use of public resources. Given the research question, it is important to mention that police activity and law enforcement are tasks assigned to the upper levels of government.

Mayors are elected in a one-round election in municipalities with less than 200,000 registered voters, while a run-off may occur in cities with more than 200,000 voters, when no mayoral candidate achieves at least 50% of the votes in the first round. Mayors can be in office for up to two four-year terms. City councilors are elected based on an open list proportional representation system, in which parties' share of seats is proportional to the number of votes cast for their candidates. According to population size, the number of councilors varies from a minimum of 9 to a maximum of 55. All elected municipal officials take office from January 1st of the year following the elections.

With respect to equal gender representation in politics, since 1997 the electoral law requires a minimum of 30% of candidates of each sex on electoral lists (e.g., party or coalition). Despite the electoral quota, the percentage of women in politics in Brazil is relatively low in both the national and the local governments. Currently, 75 of the 513 deputies are women (14.6%), as well as 11 out of 81 senators (13.6%). Appendix Table A.1 provides some statistics on the presence of women in local politics in the sample (three consecutive terms) we use for the analysis. Looking at the share of female mayoral candidates and female mayors we see that women's participation in local elections is relatively low (in 2004, 8% and 7% respectively), but increases over time (an increase of 4 p.p for both measures from 2004 to 2012). In contrast, the share of female councilors is steady at around 13%.

## 3. Data

### 3.1. Homicide and violence data

Our analysis considers two main categories of crime against the person: (i) homicide and (ii) violence against the person. Data on homicide come from the Brazilian Ministry of Health's TABNET Platform and cover the period 2000–2016. The Mortality Information System (Sistema de Informação de Mortalidade - SIM) provides detailed data at the municipality-year level about the causes of individuals' deaths. Moreover, the dataset allows us to categorize by age and place where the death has occurred. In order to enhance the interpretation of our results, we narrowed down our sample to women aged between 15 and 49 years. This is because this age bracket experiences the greatest proportion of violent acts committed by domestic partners, as indicated by [Perova and Reynolds \(2017\)](#). We further distinguished between, homicides and violence committed in a domestic context (i.e., in the victim's house), and homicide and violence committed in any context.

We consider homicides, defined as the number of deaths provoked by external causes through aggression: the group X85–Y09 of the International Classification of Diseases (ICD 10). For additional analysis in the robustness section, we also consider (from the same source) deaths due to traffic accidents, suicide and a general measure of mortality (excluding homicide). All measures are expressed as a rate for a hundred thousand inhabitants.<sup>6</sup> One of the main advantages of using

murder as a proxy for violence is related to under-reporting. It is well-known that official crime statistics may suffer from under-reporting, but this is much less applicable for murders ([MacDonald, 2002](#)). Data on violence comes from the Violence and Accidents Surveillance System (Sistema de Vigilância de Violências e Acidentes - VIVA), which provides municipality-year level data about different types of violence for the period 2009–2016. Our analysis focuses on cases of physical violence, psychological violence, sexual violence and sexual harassment against women expressed as a rate per hundred thousand inhabitants. Relevantly, the law mandates health providers to report suspected or confirmed cases of domestic violence, other violence, and sexual violence. To a certain extent, this provision of the law reduces the relevance of under-reporting issues.

### 3.2. Local election data

We focus on data about municipal elections for four electoral terms (2005–2008, 2009–2012, 2013–2016 and 2017–2020). Our data source is the Brazilian Electoral Court (Tribunal Superior Eleitoral). For each candidate in each municipal election, we know: vote share, sex, education (graduated or not), age, and party of affiliation. We also account for the share of female city councilors. It is worth noting that, as we apply an RD design in the empirical analysis, only municipalities with mixed-gender races are considered, therefore, the final sample will be composed of all municipalities-terms in which the two top candidates were of different sexes.<sup>7</sup> Overall, we have 3080 observations, of which 804 are from the term 2005–2008, 1023 from the term 2009–2012 and 1253 from the term 2012–2016. The term from 2017–2020 (1229 observations) enters the analysis only when we control potential pre-trends.

### 3.3. Other data

We complement the previous data with municipal characteristics from the Brazilian Institute of Geography and Statistics (IBGE) collected for the 2000 Brazilian decennial census. The data includes municipality-level covariates, such as population, the share of females in the population, average income per capita, the percentage of active individuals in the total population and of individuals employed in different economic sectors, income inequality with a GINI index, the percentage of the population living below the national poverty line and the percentage of illiterate individuals older than 15 years.

Summary statistics for all variables are reported in Appendix Table A.2, while their descriptions and sources are in Appendix Table A.3.

## 4. Empirical strategy

Identifying the causal effect of having a female mayor on violence against women is challenging. Simply comparing violent outcomes of municipalities governed by a female to those governed by a male mayor would not deliver a causal estimate, as the assignment of mayoral sex is not random. Therefore, we apply an RD design to our sample of mixed-gender electoral races using the following empirical specification:

$$Y_{ist} = \alpha + \beta F_{ist} + f(MV_{ist}) + \mathbf{X}_{ist} + \epsilon_{ist} \quad (1)$$

where the dependent variable,  $Y_{ist}$ , denotes, for the main evidence, the sum of cases of domestic and total homicide that occurred to women between ages 15 and 49 that took place in municipality  $i$ , belonging to state  $s$ , in term  $t$ .  $F_{ist}$  is a dummy variable indicating whether a woman wins the mayoral race in election  $t$  in municipality  $i$ , while the running variable  $MV_{ist}$  is the margin of victory in elections defined as the difference in the votes received by the two most voted-for candidates.  $f(\cdot)$  is a

<sup>6</sup> Our results are consistent also using log transformation ([Bochenkova et al., 2022](#)).

<sup>7</sup> We only include elections that were resolved in the first round.

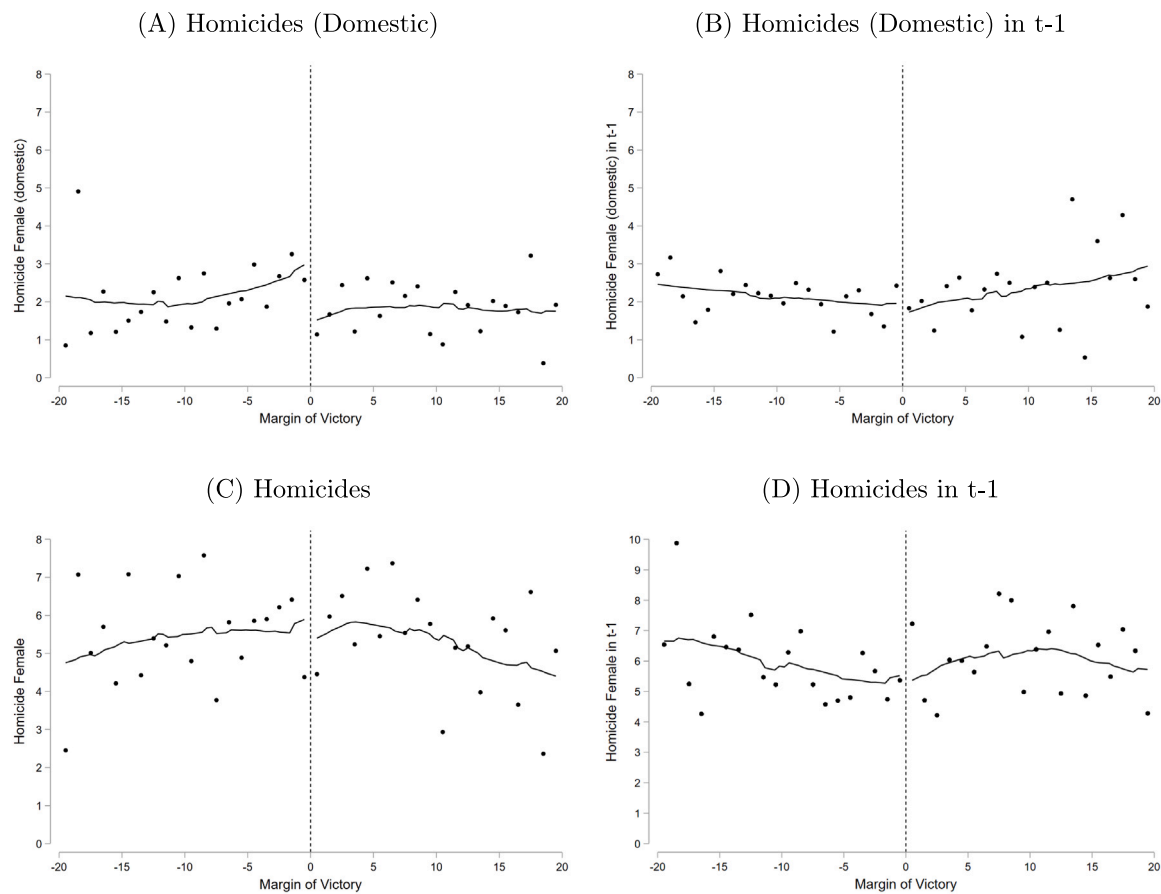


Fig. 1. Female Mayor and Homicide rate.

Notes: This figure plots homicide rates against the female mayor's margin of victory (a negative margin indicates a female candidate losing elections). Plotted points are conditional means with a bandwidth of 1. The solid line is the predicted value of a local linear smoother with a rectangular kernel and a bandwidth of 7.

polynomial function calculated on the margin of victory.  $\mathbf{X}_{ist}$  includes a set of municipal pre-determined covariates, contemporaneous mayoral characteristics and term and state fixed effects that we include in our preferred specification to improve precision in our estimates (Calónico et al., 2019). Alternatively, we include as a covariate the value of the dependent variable in the prior term. Finally,  $\epsilon_{ist}$  is the error term.  $\beta$  is our coefficient of interest, and under specific assumptions (i.e., continuity of the density of the margin of victory and that the treatment does not affect other covariates), its estimate provides a causal effect. In the Appendix, we show the results from standard validity checks of RD design. Specifically, we show that the density of the running variable is continuous at the threshold (Appendix Figure A.1) and that pre-determined characteristics are balanced (Appendix Table A.4 and Figure A.2).

For the actual implementation, we use a linear function with a rectangular kernel and employ a mean-squared error (MSE) optimal bandwidth (Calónico et al., 2014), while errors are clustered at the municipality level to account for serial correlation in the error component.

## 5. Results

### 5.1. Effect on female homicide rates

Our main results are graphically presented in Figs. 1 and show the relationship between the margin of victory and the yearly number of female homicides (total and domestic) for women and girls aged 15–49 (per 100,000 individuals on average during a term). In Fig. 1, we report the results when focusing on female homicides using alternatively contemporaneous and prior-term outcomes. Interestingly, we

can identify discontinuity at the threshold for the contemporaneous outcome of domestic homicides. In contrast, no clear discontinuity is displayed for total homicide and the outcomes in the previous term. Overall, the graphical evidence hints at the effect of having a female mayor on domestic violence against women, which is not confounded by pre-existing differences.

In Table 1, we report the formal estimates as defined in the empirical strategy section. In the first panel (Panel A), we show the RD estimates when using as an outcome variable homicides in a domestic environment, while in the second panel (Panel B), the outcome variable is the total number of homicides. The results highlighted in the graphical reporting are confirmed in the estimates. Domestic homicide rates are systematically lower in the presence of a female mayor with a level of statistical significance that ranges between 10% and 5% (columns 1–6), while there is no effect in the term prior to the victory of the female mayor (columns 7–8). The results are robust to the inclusion of covariates such as municipal-level pre-determined characteristics, mayoral characteristics, and term and state fixed effects, as well as the inclusion of the prior term value of the outcome variable. The estimated effect in the preferred specifications (first three columns) is between 47% to 50% of the mean of the dependent variable. Negative and significant coefficients are also estimated when using as bandwidth the double or half of the optimal size and when using a second-order polynomial (columns 4, 5, and 6, respectively). The estimates reported in Panel B suggest no effect of having a female mayor on the total number of women homicides. None of the estimated coefficients reach the canonical level of statistical significance, and the sign and magnitude are inconsistent across the different specifications.



**Table 1**  
Female mayor and women's homicide.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Domestic homicide rates								
Contemporaneous outcome ( <i>t</i> )						Previous term outcome ( <i>t</i> -1)		
<b>Female mayor</b>	-0.956*	-0.997**	-0.985**	-0.731*	-1.473**	-1.441**	-0.352	-0.252
	(0.502)	(0.491)	(0.498)	(0.379)	(0.675)	(0.641)	(0.614)	(0.608)
outcome mean (100k pop.)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
bandwidth	17.82	17.82	17.82	35.64	8.91	20.44	10.47	10.47
n. obs.	[1190, 954]	[1190, 954]	[1190, 954]	[1610, 1194]	[676, 622]	[1292, 1012]	[880, 782]	[880, 782]
Total homicide rates								
Contemporaneous outcome ( <i>t</i> )						Previous term outcome ( <i>t</i> -1)		
<b>Female mayor</b>	0.293	0.251	0.417	0.628	-0.769	-0.076	0.349	0.359
	(1.026)	(0.985)	(0.992)	(0.786)	(1.436)	(1.095)	(0.928)	(0.896)
outcome mean (100k pop.)	5.66	5.66	5.66	5.48	5.68	5.47	5.89	5.89
bandwidth	12.26	12.26	12.26	24.53	6.13	23.08	13.73	13.73
n. obs.	[892, 789]	[892, 789]	[892, 789]	[1610, 1194]	[478, 447]	[1369, 1066]	[1095, 945]	[1095, 945]
State FE		✓						✓
Municipal characteristics		✓						✓
Mayoral characteristics		✓						✓
Homicide rates in <i>t</i> - 1			✓					
Order polynomial	1	1	1	1	1	2	1	1
Bandwidth	CCT	CCT	CCT	2 × CCT	0.5 × CCT	CCT	CCT	CCT

Notes: The dependent variable is the number of homicides (in 100.000 p/c term) that occurred to women and girls of age 15–49 either in a domestic environment (Panel A) or in total (Panel B). Columns 1–6 refer to the term of tenure, while columns 7–8 are about the prior term. Municipality features include population size, occupational composition, income level, income inequality and previous experience with a female mayor. Mayoral features are age, level of education and party of affiliation (PT, PSDB, DEM, PMDB). The estimates are based on homicide data from three electoral terms (2004–2016). The coefficients are constructed using local linear estimators with a rectangular kernel. CCT is the bandwidth selector proposed by [Calonico et al. \(2014\)](#). Robust standard errors are clustered at the municipality level in parentheses \*  $p < 0.1$ , \*\*  $p < 0.05$  and \*\*\*  $p < 0.01$ .

**Table 2**  
Female mayor and violence against women.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Domestic violence rates								
Contemporaneous outcome ( <i>t</i> )				Previous term outcome ( <i>t</i> -1)				
	All types	Physical	Sexual	Psychological	All types	Physical	Sexual	Psychological
<b>Female mayor</b>	-32.338**	-21.888*	-1.692**	-14.839*	19.379	14.286	0.111	1.522
	(14.843)	(11.398)	(0.706)	(8.516)	(13.718)	(11.569)	(0.600)	(6.758)
outcome mean (100k pop.)	58	52	1.7	25	56	46	1.6	23
bandwidth	7.85	11.29	6.8	8.1	11.15	11.48	14.46	11.18
n. obs.	[445, 412]	[623, 545]	[394, 368]	[463, 427]	[633, 589]	[649, 602]	[789, 689]	[634, 589]
Total violence rates								
Contemporaneous outcome ( <i>t</i> )				Previous term outcome ( <i>t</i> -1)				
	All types	Physical	Sexual	Psychological	All types	Physical	Sexual	Psychological
<b>Female mayor</b>	-53.620***	-37.699**	-3.088***	-17.800	23.623	18.990	-0.121	-2.095
	(20.617)	(17.554)	(1.041)	(11.349)	(18.785)	(16.666)	(0.859)	(8.194)
outcome mean (100k pop.)	85	77	3.3	35	82	68	2.9	31
bandwidth	7.65	10.11	7.09	7.45	11.94	11.55	15.08	13.25
n. obs.	[435, 401]	[563, 496]	[405, 374]	[427, 387]	[659, 614]	[649, 604]	[815, 713]	[732, 655]
State FE	✓	✓	✓	✓	✓	✓	✓	✓
Municipal characteristics	✓	✓	✓	✓	✓	✓	✓	✓
Mayoral characteristics	✓	✓	✓	✓	✓	✓	✓	✓
Order polynomial	1	1	1	1	1	1	1	1
Bandwidth	CCT	CCT	CCT	CCT	CCT	CCT	CCT	CCT

Notes: The dependent variable is the number of violent acts (in 100.000 p/c term) that occurred to women and girls of age 15–49 either in a domestic environment (Panel A) or in total (Panel B). Columns 1–4 refer to the term of tenure, while columns 5–8 are about the prior term. Municipality features include population size, occupational composition, income level, income inequality and previous experience with a female mayor. Mayoral features are age, level of education and party of affiliation (PT, PSDB, DEM, PMDB). The estimates are based on violence data from two electoral terms (2008–2016). The coefficients are constructed using local linear estimators with a rectangular kernel. CCT is the bandwidth selector proposed by [Calonico et al. \(2014\)](#). Robust standard errors are clustered at the municipality level in parentheses \*  $p < 0.1$ , \*\*  $p < 0.05$  and \*\*\*  $p < 0.01$ .

## 5.2. Effect on violence against women

We add to previous results a set of evidence about the number of acts of violence against women. While homicides are the consequences of extreme acts of violence, one can expect the effect of political representation to be evident also in less severe abusive behavior. Therefore, [Table 2](#) presents the estimates of the effect of electing a female mayor on different types of violence against women. Columns 1 to 4, Panel A, suggest that having a female mayor in office is associated with decreased domestic violence rates. These effects are statistically significant across all types. When compared to the mean value, the

overall level of domestic violence decreases by 50%. Physical violence also sees a significant reduction of approximately 40%, while sexual violence is experiencing a 100% decrease. Additionally, psychological violence is reduced by a substantial 60%. Columns 1 to 4, Panel B, provide evidence in contrast to the primary analysis as they show a decrease in the overall number of violent incidents, not just those occurring within a domestic context. All types of violence are statistically significantly lower, apart from psychological violence, and the intensity of reductions is close to what is estimated for domestic violence. Finally, when looking at the previous term outcomes, the last

**Table 3**  
Female mayor and other outcomes.

	(1) Male	(2)	(3)	(4)	(5)	(6) Female	(7)	(8)
	Homicide	Violence	Other causes	Suicide	Traf. accident	Other causes	Suicide	Traf. accident
<b>Female mayor</b>	0.091 (0.964)	-1.830 (4.152)	-2.127 (4.773)	-0.768 (1.054)	-1.401 (2.296)	-2.108 (1.490)	-0.441 (0.454)	-1.080 (0.865)
outcome mean (100k pop.)	6.33	13.63	98.1	5.04	30.6	15.7	1.34	5.40
bandwidth	12.30	10.54	11.80	12.45	15.33	14.32	12.74	11.99
n. obs.	[895, 792]	[586, 512]	[868, 772]	[906, 799]	[1061, 889]	[1010, 856]	[924, 810]	[878, 778]
State FE	✓	✓	✓	✓	✓	✓	✓	✓
Municipal characteristics	✓	✓	✓	✓	✓	✓	✓	✓
Mayoral characteristics	✓	✓	✓	✓	✓	✓	✓	✓
Order polynomial	1	1	1	1	1	1	1	1
Bandwidth	CCT	CCT	CCT	CCT	CCT	CCT	CCT	CCT

Notes: The dependent variable is, in column 1, the number of homicides, while in column 2, the number of violent acts that occurred to men and boys of age 15–49 in a domestic environment (in 100.000 p/c term). The dependent variable in Columns 3 and 6, is the mortality rate (excluding homicide), Columns 4 and 7 is the rate of suicide, while Columns 5 and 8 is the rate of death due to traffic accidents. Municipality features include population size, occupational composition, income level, income inequality and previous experience with a female mayor. Mayoral features are age, level of education and party of affiliation (PT, PSDB, DEM, PMDB). The estimates are based on homicide data from three electoral terms (2004–2016). The coefficients are constructed using local linear estimators with a rectangular kernel. CCT is the bandwidth selector proposed by [Calónico et al. \(2014\)](#). Robust standard errors are clustered at the municipality level in parentheses \*  $p < 0.1$ , \*\*  $p < 0.05$  and \*\*\*  $p < 0.01$ .

four columns, we do not find significant effects, and this is true for both domestic and total violence.

Overall, these additional results are in line with what was reported about homicide rates, hinting at the possibility that having a female mayor in office is not only associated with a significant reduction in domestic violence against women but also with nondomestic violence. Yet, we acknowledge that differently from homicides, the used measure of violence might be more likely to suffer reporting issues that could affect the reliability of our estimates.<sup>8</sup>

### 5.3. Additional results

In this section, we provide evidence about the relationship between having a female mayor and other outcomes. First, we test whether the effect of having a female mayor on violent acts is also present when looking at male victims. In [Table 3](#), columns 1 and 2, we report the estimates from our main specification and show that there is no effect on the homicide rate and violence against men. These results reinforce the idea that having a female mayor does not have a general effect on violent crimes, but, rather the effect is limited to violence against women. It also rules out the possibility that our main result could be driven by some change associated with a female mayor coming to power that would alter the overall level of violence. For example, this would be the case if one expects a female mayor to apply stronger policies for reducing income inequality or to be effective in improving economic growth, given the link between economic conditions and violence ([Aizer, 2010](#)).

Next, we report a set of additional results addressing other possible concerns related to the main evidence being just the consequence of some structural reforms occurring during a female mayor's tenure affecting mortality in general. Again in [Table 3](#), we show the effect of having a female mayor on general mortality, the motor vehicle accident fatality rate, and the suicide rate for both males (columns 3 to 5) and females separately (columns 6 to 8). None of the coefficients are statistically significant, suggesting the specific deterrence effect towards crime against women.

## 6. Potential mechanisms

Our findings highlight a distinct “reduced form” effect of having a female mayor on domestic violence against women. This evidence suggests that women's participation in high-profile political roles can

<sup>8</sup> Moreover, for this measure, we avail of information for only two full electoral terms.

contribute to substantial mitigation of violence perpetrated against women. The specific mechanisms underlying this effect are, however, elusive given the available data. In this section, we theorize several potential channels that could account for our observations, primarily based on existing evidence.

First, the characteristics of the mayor could influence our results, hinting at a potential selection effect. We generally find the observable characteristics of the mayor to be balanced between female and male mayoral candidates; however, in line with other contexts, we find that female candidates tend to enhance the overall quality of the candidate pool ([Baltrunaite et al., 2014](#)). Specifically, our findings indicate that female mayors are generally more educated than their male counterparts. However, incorporating the education level as a covariate in our primary regression does not alter the estimates. Further, in estimates reported in Appendix Table A.6, we found that the mayor's education level has no significant impact on violence against women when tested using an RDD similar to the one used for the main results of the paper.<sup>9</sup>

Second, women in positions of power often prioritize different policies compared to men. They may be more inclined to endorse and implement strategies aimed at curbing violence against women ([Chattopadhyay and Duflo, 2004; Lippmann, 2022](#)). In Appendix Table A.5, we formally assess whether female mayors are more likely to pursue policies that are directly linked with violence against women, such as, establishing women's shelters and women's police stations but found no significant effect. Our findings align with the notion that the responsibility for police activity and law enforcement lies with higher tiers of government. However, we report results consistent with [de Lucena \(2021\)](#), demonstrating that female mayors are more likely to advocate for gender equality policies, such as local women's rights councils and women's rights boards.<sup>10</sup> Hence, women in power can leverage their influence to raise awareness about violence against women, endorse advocacy efforts, and strive to reshape societal norms and attitudes ([Chattopadhyay and Duflo, 2004; Lippmann, 2022](#)).

Finally, The presence of women in leadership can empower other women and girls, fostering greater self-esteem and assertiveness, potentially decreasing their vulnerability to violence. It can also shift norms that accept violence against women ([Beaman et al., 2012; Chong](#)

<sup>9</sup> Specifically, in Appendix Table A.6, we report estimates based on Eq. (1), where instead of focusing on the gender of the mayor, we now consider the education level of the mayor. We conduct the same procedure as previously, using the mayor's education level (i.e., being graduated or not) as the treatment variable.

<sup>10</sup> In an unreported analysis, we did not find a systematic correlation between these two policies on homicide or violence, and including them as controls in the main estimations do not affect the results.

and Ferrara, 2009). Exposure to successful female politicians might encourage women to resist violence (Jensen and Oster, 2009) and could alter men's perception of women's societal roles (Beaman et al., 2009). However, we cannot verify this hypothesis due to the lack of pertinent survey data.

## 7. Conclusion

This study underscores the impact of female political leadership on femicide and violence against women. Leveraging municipality-level data from Brazil spanning from 2005 to 2016 and utilizing a Regression Discontinuity (RD) design in close elections, we demonstrate that electing a female mayor results in a substantial and significant decrease in femicide and violence against women. Our findings withstand scrutiny from placebo regressions and conventional validation and falsification tests for the RD design. This effect is distinct and not merely reflective of initial violence levels or part of a broader reduction in violence. Our evidence contributes to the expanding literature emphasizing the transformative potential of enhancing female representation in public offices in society at large. Further investigations are warranted to empirically delineate the channels through which women in politics can affect violence, such as a role model effect or specific policy changes.

## CRediT authorship contribution statement

**Alena Bochenkova:** Research idea, Data collection, Data analysis, Revision of the paper. **Paolo Buonanno:** Research idea, Data collection, Data analysis, Revision of the paper. **Sergio Galletta:** Research idea, Data collection, Data analysis, Revision of the paper.

## Data availability

Data will be made available on request.

## Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.jdeveco.2023.103140>.

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## Further reading

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