

# Women politicians reduce violence against women: Evidence from Mexico

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## Abstract

Are women politicians more likely to reduce violence against women (VAW) than men politicians? Women's political representation has increased around the world and research has shown that women politicians are more likely to create and implement gendered laws, policies, and programs to promote women's well-being. Yet, beyond policy-making, we know much less about the effects that women politicians have on actual outcomes, including on instances of VAW. This study estimates the effects that women politicians in local office have on VAW in Mexico using a pre-registered regression discontinuity design. We find that municipalities with women mayors have significantly fewer violent crimes against women compared to municipalities with men mayors, and that this effect becomes more pronounced the longer women politicians are in office. Specifically, our most conservative specification suggests that women mayors prevent 3.7 homicides of women and 2.8 homicides of young women during the first two years of their term. These results suggest that women holding political office may help improve women's safety and well-being.

## Significance Statement

Violence against women (VAW) is a pervasive problem in many countries. In Mexico, two thirds of women report experiencing some type of violence during their lifetime. Some scholars have found that women's political representation matters for addressing gender-specific issues. We examine the effects of women holding local executive office on the prevalence of VAW. Analyzing local politicians in Mexico, we find that, compared to men mayors, women mayors reduce the most severe forms of VAW and that this effect increases throughout their tenure. Our results suggest that women's political representation may be one important pathway to address VAW.

# 1 Introduction

Violence against women (VAW) is a pervasive problem across the world. According to the World Health Organization (WHO), 33% of women worldwide – around 736 million women – experience physical or sexual violence in their lifetime (World Health Organization, 2021). Given that a large body of research has found that women in office are more likely to create, support, and implement gendered laws, policies, and programs to promote women’s well-being (Cain Miller, 2016-11-10; Franceschet et al., 2012; Piscopo, 2014; Córdova and Kras, 2022; Garcia-Ramos, 2021; Brassiolo, 2016; Miller and Segal, 2019; Perova and Reynolds, 2017; Jassal, 2020; Artiz Prillaman, 2022; Volden et al., 2018; Barnes, 2016; Barnes and Holman, 2020; Barnes et al., 2021; Clayton and Zetterberg, 2018), some have argued that women’s political representation may be an important condition for improving women’s welfare, specifically by addressing VAW. However, we know little about the effects that women politicians have on actual outcomes, and even less about their effects on VAW. Research has found that women politicians increase the reporting of crimes against women but not their prevalence in India (Iyer et al., 2012) and change gendered beliefs in Indonesia and India (Kuipers, 2020; Beaman et al., 2009). These studies suggest that women politicians may matter for changing citizen’s beliefs about VAW and their likelihood of reporting VAW, but do not provide evidence that they reduce instances of VAW.

It therefore remains unclear whether women politicians have an effect on VAW. In other words, do women politicians better address VAW compared to men politicians? To answer this question, we look at local politicians and VAW outcomes in Mexico. We follow a pre-registered research design that employs a quasi-experiment to estimate the causal effect of having a woman politician on different forms of VAW.<sup>1</sup> Specifically, we use a regression discontinuity design (RDD) to compare VAW outcomes in municipalities where women politicians narrowly defeated men politicians with municipalities where men politicians narrowly defeated women politicians.

Drawing on data from the 2018 local elections across 1,324 municipalities and VAW outcomes during the three-year mayoral terms that followed (2019 - 2021), we find that women politicians that narrowly win office reduce VAW, and particularly severe forms of VAW, including homicides of women and rape. Moreover, point estimates *increase* in size the longer a woman politician is in office, suggesting that women politicians reduce VAW and that this effect increases the longer they are in office.

## Women’s Political Representation and Violence Against Women

Scholars have long argued that women’s political representation matters for gender-salient laws, policies, and outcomes. The literature supports this notion, and has largely found that women in office are more likely to create, support, and implement gendered laws, policies, and programs to promote women’s well-being (Cain Miller, 2016-11-10; Franceschet et al., 2012; Córdova and Kras, 2022; Garcia-Ramos, 2021; Brassiolo, 2016;

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<sup>1</sup>Pre-Analysis Plan was registered in the Open Science Foundation registry prior to data collection and is available at <https://osf.io/7ty4q>

Miller and Segal, 2019; Perova and Reynolds, 2017; Jassal, 2020; Artiz Prillaman, 2022; Volden et al., 2018; Barnes, 2016; Barnes and Holman, 2020; Barnes et al., 2021; Clayton and Zetterberg, 2018). However, a few studies have also found that increased descriptive representation does not always translate into more gendered policies (Ellerby, 2017), that substantive representation may be institutionally hindered even when descriptive representation is present (Lovenduski, 2005; Volden et al., 2013, 2018; Ellerby, 2017), and that increased representation of women may prompt patriarchal backlash and result in even less gender-equal outcomes in some cases (Clayton, 2021; Berry et al., 2021). In other words, women's political representation matters for gendered issues, though these effects are not universal, and are sometimes constrained by poor implementation, informal practices, or quota design shortcomings.

One gender-salient issue of particular importance due to its impact and prevalence is gender-based violence, and specifically, VAW. Because VAW by definition targets and victimizes women, scholars, experts, and activists alike have argued that women's political representation may be an important factor for addressing VAW. Therefore, analyzing the linkages between women's political representation and VAW is crucial. This is especially true given that women's electoral success is at an all-time high (Inter-Parliamentary Union, 2022) even while governments around the world struggle to combat gender-based violence. Despite such a puzzling trend, we know little about the effects of women's political representation on VAW and findings from the literature are mixed.

At the legislative level, scholars have found no association between the number of women in legislatures and either the comprehensiveness and implementation of VAW policies (Beer, 2017) or progressive policies to combat VAW (Htun and Weldon, 2012). At the subnational level, some have found that women's election into local government can decrease the proportion of women (and to some degree, men) that hold deeply gendered attitudes and beliefs (Beaman et al., 2009; Kuipers, 2020), such as believing a husband is justified when beating their wife (Kuipers, 2020). Perhaps most relevant, a study looking at India found that women's descriptive representation in local governments and as heads of local governments had no effect on the prevalence of VAW crimes but did increase the number of reported crimes against women as well as arrests for these crimes (Iyer et al., 2012).

Therefore, although progress has been made in the study of women's representation and VAW, less is known about the effect that women politicians may have on instances of VAW, particularly when women hold executive office. Existing studies find that women politicians can change gendered beliefs and increase the reporting of VAW crimes, but not the prevalence of VAW crimes. This study contributes to the literature by directly examining the empirical relationship between women's political representation and VAW outcomes, including both actual instances of VAW and reported crimes.

## Women Politicians and Violence Against Women in Mexico

To answer our research question, we focus on Mexico. Mexico provides an informative and illustrative case to examine the effects of women politicians on VAW because (1) women's representation is high and voters evaluate women politicians more positively

than they evaluate men politicians; (2) VAW is a prevalent issue that has become politically salient for voters and politicians; and (3) institutions designed specifically to advance women's issues exist at multiple levels that can facilitate the efforts of politicians seeking to support and protect women.

First, the integration of quotas has led to a significant increase in the number of women in political office in national and sub-national positions ([Corley, 2022-03-07](#); [Inter-Parliamentary Union, 2022](#); [Krook, 2009](#); [Franceschet et al., 2012](#); [Sarah and Mona, 2008](#); [Jalalzai and Krook, 2010](#)). Mexico ranks fourth worldwide for the proportion of women in the national legislature having nearly reached complete gender parity ([Inter-Parliamentary Union, 2022](#)). At the local level, following the 2018 election, women held 26% of mayoral positions ([ONU Mujeres, 2018-12](#)) – increasing 20 percentage points over the last three decades ([Vázquez Garcia, 2010](#); [Cárdenas Acosta, 2019b](#)). Additionally, women's political representation appears to matter to voters, with a recent AmericasBarometer survey in Mexico finding that 86.7% of respondents believe that women are better political leaders, 21.3% that men politicians are more corrupt than women politicians, while only 2% that women politicians are more corrupt than their men counterparts ([LAPOP, 2021](#)).

Second, Mexico suffers from high levels of VAW, with over 66% of women reporting that they have suffered at least one form of violence throughout their lives ([Instituto Nacional de Estadística y Geografía, 2017](#)), and an average of ten women are murdered per day across the country ([OECD, 2017](#)). The high prevalence of VAW has made it a contentious and politically salient issue in Mexico that has now become a key campaign topic in some electoral races ([Arista, 2022](#)). A recent survey in Mexico found that 96% of women and 94% of men believe that VAW is "a grave or very grave issue" ([Morán Breña and Galindo, 2021](#)). This has led to numerous anti-VAW marches, demonstrations, and protests aimed at local and national level politicians, governments, and agencies. For example, on March 8, 2020 – International Women's Day – more than 80 thousand individuals participated in a march against VAW in Mexico City ([Excelsior, 2020](#)), with thousands more marching in other states ([El Universal, 2020](#)). The next day, an estimated 22 million women participated in the "A Day Without Us" strike to protest VAW ([Ayala, 2020](#)).

There is also evidence that women politicians in Mexico may be more conscious about and receptive to VAW as a political issue because violence against women in politics (VAWIP) is a serious problem ([Sanin, 2020](#); [Rodríguez Calva and Frias, 2020](#); [Cárdenas Acosta, 2019a](#)). For example, there were 237 aggressions against women politicians recorded in 2018, including 23 homicides ([Molina, 2019](#)). The issue has gained enough traction that in 2018 all political parties registered at the national level signed several commitments with UN Women to address VAWIP within their ranks ([Peralta, 2021](#)).

Political backlash against rising feminist and women's movements has contributed to the political salience of VAW ([Cárdenas Acosta, 2019a](#); [Cerva Cerna, 2020](#); [Beer, 2021](#)). At the federal level, the current Mexican president has claimed that 90% of VAW incidents reported to the national emergency number were fake ([Animal Politico, 2020](#)) and accused feminist movements of being infiltrated and manipulated by his political opposition to sabotage his administration ([Salinas Maldonado, 2021](#)). At the local level, instances of politicians dismissing or minimizing VAW are abundant. For example, following two highly publicized femicide cases, the men mayors of the municipalities

where they occurred publicly stated that VAW does not exist (Magallanes, 2022; López, 2019).

Third, Mexico has created institutions meant to specifically address women issues, including VAW. At the federal level, the National Institute for Women (INMUJERES) heads efforts to promote and advance women's issues,<sup>2</sup> the National System for the Prevention, Attention, Punishment and Eradication of Violence Against Women co-ordinates inter-agency efforts against VAW across all levels of governments,<sup>3</sup> and the National Commission to Prevent and Eradicate Violence Against Women (CONAVIM) designs national policies meant to address VAW.<sup>4</sup> At the sub-national level, each state and municipality has its own Institute for Women. Together with the National Institute for Women, these state- and municipal-level agencies coordinate to manage Women Development Centers, which are physical facilities designed to provide services, support, education, and other resources to empower women (Instituto Nacional de las Mujeres, 2020).

## Local Politicians and Violence Against Women

We focus on local politics and examine the effects that women mayors have on VAW. Mayors in Mexico provide an appropriate case to study this relationship because Mexico's federal system bestows considerable *de jure* powers to local governments and mayors also enjoy considerable *de facto* power (Sele, 2012, 2011). Importantly for VAW, influence over local law enforcement, social programs, and Women Development Centers provide mayors with the means to design and implement policies aimed at protecting women.

Most mayors in Mexico have power over local law enforcement, including appointing the police chief, controlling public safety expenditure, and coordinating local policing efforts with state and federal authorities. This allows mayors to enact certain organizational changes and policies meant to address VAW through law enforcement. Local governments can also implement programs or create agencies meant to address social issues, which are usually part of the annual Municipal Development Plan. Additionally, mayors also have some important power over the Women Development Centers because local governments are responsible for providing the facilities, appointing the head of the municipal Institute for Women, coordinating with the State Institute for Women to hire the personnel who will provide professional services, and hiring the operational staff (Instituto Nacional de las Mujeres, 2020).

To provide some examples, to address VAW, some women mayors have provided legal and psychological support to the family of the victim and launched cultural arts initiatives against VAW (Aguilar Pastor, 2022), created municipal Departments for Women to pursue policies addressing women development, equality, empowerment, and safety (La Jornada, 2020), integrated women institutes and issues into municipal governments (Agúndez, 2020), inaugurated facilities for the Specialized Unit in Domestic and Gender Violence (de Tlaquepaque, 2020), and fired police commands for perpetrating violence against women (Yañez, 2020).

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<sup>2</sup><https://www.gob.mx/inmujeres>

<sup>3</sup><https://www.gob.mx/conavim/articulos/que-es-el-sistema-nacional-de-prevencion-atencion-sancion-y>

<sup>4</sup><https://www.gob.mx/conavim>

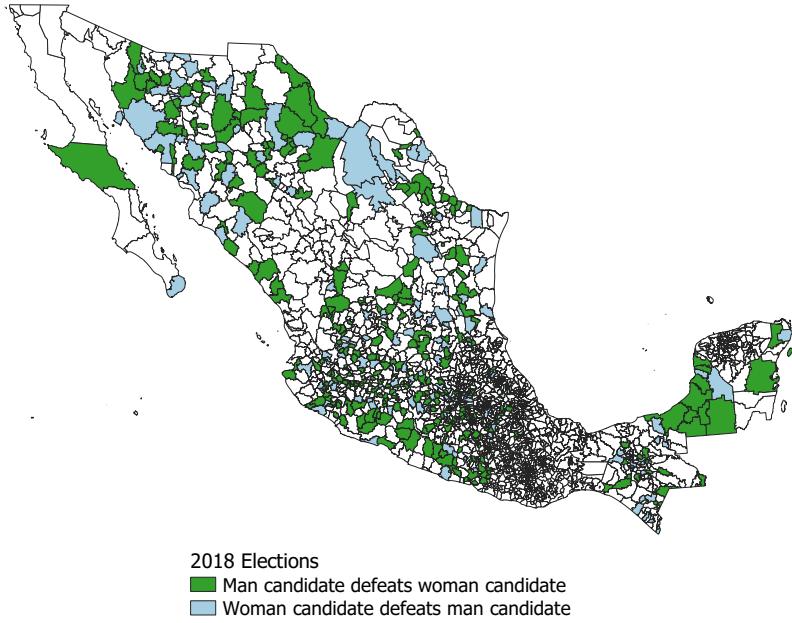


Figure 1: Geographic distribution of municipalities with elections in 2018 where either a woman candidate defeated a man candidate (shown in light blue) or a man candidate defeated a woman candidate (shown in green).

## Data

To test the effects that women politicians have on VAW, we look at mayors in Mexico and exploit close elections to compare women politicians that narrowly defeated men politicians with men politicians that narrowly defeated woman politicians. To do this we collect data on mayoral elections, the gender of mayoral candidates, and VAW outcomes at the local level.

Mexican mayors are elected by plurality rule, serve for three years and typically start their terms towards the end of the election year. We collect data on the 1,324 local elections that took place in 2018 across 22 states,<sup>5</sup> and VAW outcome data for the three years of the mayoral administration (2019 – 2021).

For each election, we collect data from each state's electoral agency on the number of votes for the winning candidate and second place candidate, as well as the total number of votes in each municipality from each state's electoral agency.<sup>6</sup> Using the electoral data, we calculate the winning margin for each election.

While the government provides the gender of the winning candidate that becomes

<sup>5</sup>25 states held local elections in 2018. We exclude municipalities in the state of Oaxaca, as is standard in the literature, because hundreds of municipalities follow indigenous self-governance that use different electoral rules. We also exclude municipalities in the states of Tabasco and Yucatán due to lack of data on the gender of candidates.

<sup>6</sup>In the pre-analysis plan we stated that we would use electoral data from a third-party repository ([Magar, 2018](#)), however, in the process of validating the data we found inaccuracies and thus hand-collected official data for each election from each state's electoral agency.

mayor, the gender of candidates that do not win is not systematically collected or reported.<sup>7</sup> This information is crucial for our study because the identification strategy relies on comparing municipalities where a woman candidate barely defeats a man candidate and municipalities where a man candidate barely defeats a woman candidate. We thus hand-code the gender of the first and second place candidates in each election using information from each state's electoral agency.<sup>8</sup> Figure 1 shows the geographic distribution of our sample; that is, the municipalities where elections took place in which a woman candidate defeated a man and vice versa. Of the 1,324 municipalities we collected data on, 559 (42%) held elections where a woman and a man were the top two vote-receiving candidates.

Second, VAW is an umbrella term that captures different forms of gender-based violence. The U.N. defines VAW as "any act of gender-based violence that results in, or is likely to result in, physical, sexual, or mental harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life" (United Nations, 1993). We use various sources of data to measure different dimensions of this concept for each of the three years of the mayoral administration (2019 – 2021).

To capture the most egregious form of VAW we use three distinct measures of homicides of women: official femicide instances as defined by the Mexican government, the number of homicides of women, and the number of homicides of young women (ages 15-44). Data on the number of femicides comes from the Executive Secretariat of the National Public Security System (*Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública* or SESNSP) ([Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública, 2022](#)). Since 2015 the Mexican government classifies certain intentional homicides as femicides if they are deemed to meet at least one of nine criteria outlined in Article 325 of the Federal Penal Code.<sup>9</sup> However, various experts have deemed the official data to be an under-count of actual femicide instances. To overcome this potential bias, we also use the total number of homicides of women, which we collect from death certificate data from Mexico's National Institute of Statistics and Geography (*Instituto Nacional de Estadística, Geografía y Informática* or INEGI) ([Instituto Nacional de Estadística, Geografía y Informática, 2021b](#)). This is the standard practice of various human rights organizations in Mexico to account for the severe under-reporting and lack of accurate data on femicides ([Torreblanca, 2018-11-12](#); [Flores, 2021-10-14](#)). To more precisely measure homicides of women that may be the result of gender-based violence, we also create a new measure of homicides of young women, defined as women between the ages of 15 and 44, from death certificate data. The age range is chosen because sources have found that the majority of femicide victims in Mexico ([SEGOB et al., 2017](#)) and Latin America ([Economic Commission for Latin America and the Caribbean \(ECLAC\), 2021](#)) fall within this age range. One limitation is that data on homicides of women and young women are available for 2019 and 2020, but not 2021.

To measure other forms of VAW we use data from the SESNSP crime registry ([Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública, 2022](#)), which includes instances of crimes reported to authorities. Specifically, we use data on the number of

<sup>7</sup>Some states do report this information, though rarely in a systematic manner, while others do not.

<sup>8</sup>Details on how gender was coded can be found in the *SI Appendix*.

<sup>9</sup>See Article 325 <https://www.gob.mx/conavim/articulos/que-es-el-feminicidio-y-como-identificarlo>.

Table 1: Full sample summary statistics of VAW outcomes at the municipality level.

Statistic	Mean	St. Dev.	N
<i>2019</i>			
Homicides of women	2.08	6.85	559
Homicides of young women	1.43	4.90	559
Femicides	0.48	1.48	559
Rape	7.05	22.46	559
Domestic violence (in tens)	11.08	385.82	559
Sexual abuse	14.44	50.85	559
Sexual harassment	3.40	13.70	559
<i>2020</i>			
Homicides of women	2.10	6.84	559
Homicides of young women	1.49	5.38	559
Femicides	0.46	1.29	559
Rape	6.76	23.36	559
Domestic violence (in tens)	12.07	404.38	559
Sexual abuse	13.67	44.76	559
Sexual harassment	4.15	13.63	559
<i>2021</i>			
Femicides	0.57	1.76	559
Rape	8.14	27.34	559
Domestic violence (in tens)	13.88	451.53	559
Sexual abuse	17.12	56.97	559
Sexual harassment	5.17	16.86	559
<i>Pooled</i>			
Homicides of women	4.17	13.44	559
Homicides of young women	2.92	9.98	559
Femicides	1.51	4.22	559
Rape	21.95	71.08	559
Domestic violence (in tens)	37.03	1,231.07	559
Sexual abuse	45.23	151.57	559
Sexual harassment	12.71	43.12	559

reported cases of sexual harassment, sexual abuse, rape, and domestic violence from 2019 to 2021. One limitation is that these reported crimes are not disaggregated by the gender of the victim. However, since the vast majority of sexual crimes and domestic violence crimes are perpetrated against women (CDC, 2021-11-02; Jaitman and Anauati, 2019), we believe that this data provides a valid measure of our proposed concept. Additionally, this data measures reported, not actual, crimes, and therefore understates the prevalence of these crimes (Jaitman and Anauati, 2019). All VAW measures are collected by municipality and year. We explore these outcomes both disaggregated by year of the mayors' term (2019, 2020, 2021) to see whether there are temporal effects, and pooled (total instances during the three years of the administration) to see whether there are overall effects. Table 1 shows the descriptive statistics of each variable for our full sample.

## Regression Discontinuity Design

Identifying the effect women politicians may have on VAW is not straightforward. Simply comparing VAW outcomes between municipalities with women mayors against those with men mayors may result in biased estimates arising from endogeneity issues.

To infer the causal effect of having a woman mayor on VAW outcomes, we use an RDD of close elections as is now standard in the literature. Specifically, our pre-registered research design exploits close mayoral races in 2018 where either: (1) a woman candidate narrowly defeats a man candidate, or (2) a man candidate narrowly defeats a woman candidate.<sup>10</sup> By comparing women candidates who barely defeat men candidates and men candidates that barely defeat woman candidates, we can estimate the causal effect of electing women politicians on VAW if the continuity assumption is met (De la Cuesta and Imai, 2016).

Formally, we estimate the following specification:

$$y_i = \alpha + \tau W_i + \beta f(X_i) + \epsilon_i \quad (1)$$

where  $y_i$  denotes the different VAW measures,  $X_i$  is the margin of victory that takes positive values when a woman candidate wins and negative values when a man candidate wins,  $W_i$  is a binary variable that takes the value of 1 when  $X_i \geq 0$  and 0 otherwise, and  $f(X_i)$  is a polynomial that denotes the functional form used to estimate the model. The coefficient of interest is  $\tau$ , which estimates the causal effect of having a woman mayor on outcome  $y_i$ . Since  $X_i$  is measured from a plurality electoral system, the RDD has multiple cutoffs and  $\tau$  can thus be interpreted as the weighted average of the local average treatment effect across vote shares (Cattaneo et al., 2016). However, if we assume constant treatment effects,  $\tau$  can be interpreted like a single-cutoff RDD design: the overall average of the local average treatment effect.<sup>11</sup>

Following the literature, we estimate bias-corrected first and second-order polynomials (Calonico et al., 2014; Gelman and Imbens, 2019) using optimal bandwidths that

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<sup>10</sup>We do not include close elections where the top two candidates were of the same gender, as the counterfactual of these elections would be a candidate of the same gender winning the election.

<sup>11</sup>See SI Appendix for more details.

minimize the mean-squared error (Calonico et al., 2014) and robust standard errors. Specifically, we rely on the `rdrobust` package in R (Calonico et al., 2015).<sup>12</sup>

The key assumption of the RDD design is that potential outcomes are continuously distributed at the treatment cutoff; that is, the only change at the cutoff is the treatment status (De la Cuesta and Imai, 2016). In our case this means that treatment assignment relies only on the running variable, the winning margin, and not on any other variable that may affect VAW. The continuity assumption could be violated if units are able to influence the running variable and sort around the cutoff or if there are discontinuities in confounders at the cutoff. We employ three checks to provide evidence that the continuity assumption is met: tests of sorting, tests of covariate continuity along the threshold, and placebo tests with past outcomes.

First, the RDD assumption of continuous potential outcomes around the treatment threshold could be violated if candidates can influence their assignment-to-treatment (the margin of victory) and sort nonrandomly around the threshold. To formally test whether there is candidate sorting around the treatment cutoff, we conduct the McCrary test (McCrary, 2008), which is standard in the literature. We find null results, suggesting there is no evidence of manipulation of the running variable.<sup>13</sup> To provide further evidence, we also validate the continuity using a nonparametric test (Cattaneo et al., 2020) and find no evidence of sorting. Both tests support the continuity assumption. All robustness checks for sorting are presented and described in greater detail in the *SI Appendix*.

Second, using data on municipality-specific sociodemographic factors from the 2010 Census (Instituto Nacional de Estadística, Geografía y Informática, 2021a), including gender-specific variables such as the number of women, women-run households, and economically active women, and the average education of women, we conduct balance tests by estimating the RDD with these sociodemographic variables as outcomes. These tests show no discontinuity at the threshold (results shown in *SI Appendix, Table S1*). Finally, we run placebo tests to demonstrate that electing a woman candidate in 2018 has no effect on *past* VAW outcomes – specifically homicides of women and young women in 2010 and 2017 (results shown in *SI Appendix, Tables S2 and S3*). We select 2010 because it is the same year as the sociodemographic data and 2017 because potential candidates for the 2018 election had to register their candidacy in late 2017. Null results in these placebo tests provide compelling additional evidence that women politicians did not self-select into and win close elections in municipalities with high VAW levels, and that there is no spurious correlation due to some third confounder driving both VAW and the electoral success of women politicians in close elections. Balance tables and placebo test results are shown and described in greater detail in the *SI Appendix*.

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<sup>12</sup>In our pre-registered research design, we noted that we planned to estimate the RDD using two procedures to calculate optimal bandwidths: Imbens and Kalyanaraman (2012) (herein IK) (Imbens and Kalyanaraman, 2012) and Calonico, Cattaneo, and Farrell (2020) (herein CCF) (Calonico et al., 2019). However, CCF improves upon the MSE-optimal bandwidth selectors from IK, as discussed in (Calonico et al., 2014), and we therefore only calculate bandwidths using this method.

<sup>13</sup>Caughey and Sekhon (Caughey and Sekhon, 2011) argue that this assumption could be violated if some candidates are more likely to win narrow victories because of financial or experiential advantages, though de la Cuesta and Imai (De la Cuesta and Imai, 2016) highlight that for this mechanism to violate the continuity assumption candidates would need to be incredibly precise in their manipulation, which is unlikely.

## Results

The main RDD results for the different VAW outcomes are shown in Table 2 and visualized in Figure 2. The plots in Figure 2 show the RDD point estimates and confidence intervals for the effect of women politicians on various VAW outcomes during their first (2019), second (2020), and third (2021) years in office, as well as pooled results for their three-year administration. The dots represent the estimated coefficients, while the thick lines represent 90% confidence intervals and the thinner lines represent 95% confidence intervals. The  $y$ -axis shows the effect size, while the  $x$ -axis shows the year of the outcome data used. The first row shows the results for the different measures of homicides of women, while the second row shows the results for the different measures of VAW crimes. The first column shows RDD estimates using a linear specification while the second column shows RDD estimates with a more flexible specification, a second-order polynomial.

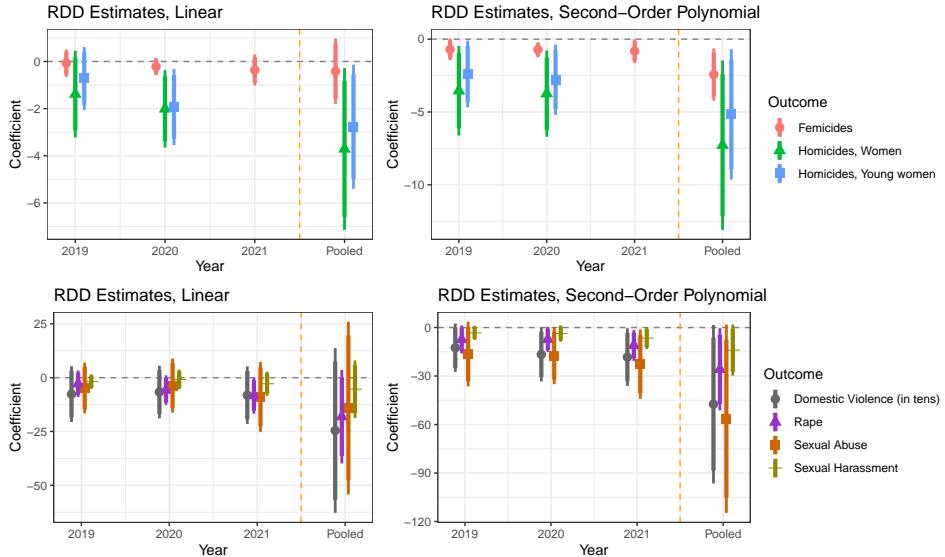


Figure 2: Regression discontinuity results of electing women politicians. Top row shows results for measures of homicides of women, and bottom row shows results for measures of reported VAW crimes. First column shows linear results and second column shows second-order polynomial results. 90% (thick lines) and 95% (thin lines) show robust confidence intervals. We include results for each year of the mayor's three-year term (2019-2021) and overall pooled effects.

We find that all point estimates are negative, which is consistent with the conclusion that women politicians reduce VAW. However, there are important nuances across model specifications. Generally, we find strong and robust evidence that women politicians reduce the most severe forms of VAW (homicides of women, homicides of young women, and rape). However, while the point estimates are negative, the results for other VAW-related crimes (sexual harassment, sexual abuse, and domestic violence) are only statistically significant at conventional levels using the quadratic RDD and not the linear RDD.

Most notably, we find strong causal evidence that women politicians reduce the most severe form of VAW: homicides of women and young women. Both linear and

quadratic RDD results find that women politicians reduce homicides of women and homicides of young women. Moreover, all point estimates *increase* in size the longer a woman politician is in office, suggesting that women politicians reduce homicides of women and that they reduce it more the longer they are in office. Specifically, linear RDD point estimates suggest that during their first two years in office, women mayors prevent 3.71 homicides of women and 2.77 homicides of young women. These effects are substantively large, as the mean number of homicides of women and young women at the local level during this period were 4.17 and 2.92, respectively.

For VAW-related crimes, including rape, sexual harassment, sexual abuse, and domestic violence, both linear and quadratic point RDD estimates are negative, and they also increase in size by the third year of a mayor's term. However, linear RDD results are only statistically significant at the 10% level for rape during the second and third years of a mayor's term. During these years, linear RDD point estimates suggest that women politicians reduce rapes by 5.79 and 8.3, respectively. In addition, the more flexible quadratic RDD finds a negative and statistically significant effect on rape, domestic violence, and sex abuse during the second year of the administration ( $p < 0.1$ ), and an even larger negative effect during the third year of the mayor's administration ( $p < 0.05$ ). For sexual harassment, the effect is only statistically significant at  $p < 0.1$  for the third year of a mayor's term. Finally, the pooled results using the quadratic RDD are all negative and statistically significant at  $p < 0.1$ , with rape at  $p < 0.05$ . RDD results using higher order polynomials, though not pre-registered and thus not included here, are consistent with the results of the quadratic RDD model, showing statistically significant negative results that increase in size through a woman mayor's term.<sup>14</sup>

The results provide compelling evidence that women politicians reduce VAW. Yet, this could be explained by women politicians simply being better at addressing violence and crime more generally – not only those related to gender. While this would not alter the results that women politicians reduce VAW, it may lead to a different interpretation of the results. To explore this possibility, we estimate the RDD using outcome measures of other types of violence and crime: the homicides of men and young men as well as four of the most prevalent crimes in Mexico (extortion, home burglary and vehicle theft, kidnapping, and drug dealing). Results (shown in *SI Appendix, Table S5*) show that women politicians cause a short-term (first year in office) reduction on homicides of men. However, unlike the results for homicides of women, the effects become smaller and lose their statistical significant at the 5% level during a woman politician's second year in office. These results tell us that women politicians reduce homicides of both men and women during their first year in office, but increase their impact on homicides of women during their second year, while their effects on homicides of men and young men decrease and lose their statistical significance at the 5% level. This suggests that women have an overall effect on reducing homicides, though this effect is short-lived for homicides of men and not only persistent for homicides of women, but even larger in subsequent years.

We also find that women politicians have no effect on the prevalence of reported non-VAW crimes for any year (no results are statistically significant at either  $p < 0.05$

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<sup>14</sup>These results run counter to the expectations we preregistered in our pre-analysis plan where we hypothesized that women politicians would increase the reporting of VAW crimes.

or  $p < 0.1$ ). Interestingly, though not statistically significant, some point estimates for kidnapping, theft, and extortion are positive, suggesting that the consistent negative effects of women politicians on reported VAW crimes are not due to some phenomenon wherein all crimes and forms of violence are either lower or are less reported in municipalities with women mayors. Together, these results suggest that women politicians reduce VAW crimes – particularly severe forms of VAW – and not crimes in general, though they do have some short-term effect on homicides of men as well.

An important scope condition of our research design is that it can only speak to close elections and not to women politicians that win or lose elections by wide margins, as they may be systematically different than women involved in close elections. Another key consideration is that our measures of VAW-related crimes are reports of these crimes, not actual instances of VAW crimes. Therefore, an alternative interpretation of our results that we cannot empirically rule out is that women politicians that win close elections may simply reduce reporting of VAW crimes and not their actual prevalence. However, because the results using homicides – measured through death certificates, not reports – show that women politicians that win close elections reduce homicides of women (and these results are strong and robust) and because previous research shows that women politicians *increase* VAW reporting (Iyer et al., 2012), we interpret the results using crime reports as a reduction in these crimes and not as a negative reporting effect. This interpretation has an additional important implication: If women politicians in our sample also cause an increase in the reporting of VAW crimes, the RDD point estimates will be underestimating the true effect that women politicians have on reducing instances of VAW crimes. This could imply that our estimates on VAW crimes are conservative.

## Discussion

Do women politicians reduce VAW? In this paper, we address this puzzle by exploiting close elections in Mexico to estimate the effect that women mayors have on various forms of VAW, including homicides, femicides, and other reported gender-based violent crimes against women. Using novel data on the gender of mayoral candidates and a pre-registered causal research design, we find that women politicians that narrowly defeat men politicians in elections reduce various forms of actual and reported instances of VAW, and that this effect strengthens over a woman mayor’s term in office. Given previous literature and the decrease in actual instances of VAW, we interpret the results on reported VAW crimes as a reduction in prevalence rather than in reporting. Our results imply that, in a context where VAW is politically salient and institutions advancing women’s issues exist, electing women politicians at the local level can reduce VAW, even when efforts to address VAW at the federal level may be insufficient (Farfán-Mendez, 2022-05-22). Furthermore, our results are substantively important. Our conservative model suggests that women politicians that narrowly won elections saw almost three fewer homicides of young women during their first two years in office.

While a large body of literature has studied the election and incorporation of women into legislatures and the subsequent effects, much less is known about women’s political representation at the local level and in executive positions. Our results suggest that women’s political representation in executive positions and at the local level may be

Table 2: Regression discontinuity results: Effect of women politicians on VAW.

	Linear RDD				Quadratic RDD			
	2019	2020	2021	Pooled	2019	2020	2021	Pooled
Homicides of women	-1.384 (0.939)	-2.011** (0.838)		-3.709** (1.750)	-3.542** (1.570)	-3.741** (1.509)		-7.278** (2.964)
n	370	370		368	374	368		372
Bandwidth	0.073	0.070		0.069	0.081	0.077		0.078
Homicides of young women	-0.721 (0.681)	-1.929** (0.823)		-2.771** (1.343)	-2.390** (1.169)	-2.784** (1.232)		-5.165** (2.280)
n	381	346		368	382	372		374
Bandwidth	0.081	0.061		0.068	0.086	0.078		0.079
Femicides	-0.072 (0.295)	-0.218 (0.187)	-0.361 (0.337)	-0.416 (0.706)	-0.708* (0.379)	-0.724*** (0.264)	-0.824** (0.419)	-2.431*** (0.918)
n	439	416	431	454	430	405	409	414
Bandwidth	0.115	0.092	0.105	0.117	0.122	0.101	0.112	0.108
Rape	-2.854 (3.148)	-5.789* (3.495)	-8.302* (4.307)	-18.146 (11.080)	-7.403* (4.426)	-7.276* (3.983)	-11.053** (4.878)	-25.831** (12.985)
n	391	324	333	335	377	388	396	385
Bandwidth	0.090	0.067	0.067	0.070	0.095	0.100	0.099	0.097
Domestic violence (in tens)	-7.655 (6.613)	-6.679 (6.239)	-8.142 (6.814)	-24.555 (19.537)	-12.479 (7.641)	-16.633* (8.503)	-18.320** (9.095)	-47.431* (25.009)
n	357	433	408	395	391	399	393	396
Bandwidth	0.076	0.100	0.092	0.087	0.104	0.105	0.101	0.103
Sex abuse	-4.786 (6.041)	-3.705 (6.432)	-8.953 (8.279)	-14.120 (20.471)	-16.417 (10.218)	-17.334* (9.022)	-22.606** (10.961)	-56.383* (29.746)
n	440	440	381	426	388	399	393	393
Bandwidth	0.099	0.104	0.085	0.098	0.097	0.101	0.096	0.097
Sexual harassment	-1.829 (1.703)	-0.830 (2.362)	-2.840 (2.865)	-5.308 (6.819)	-3.305 (2.236)	-3.663 (2.605)	-6.563* (3.433)	-13.985* (8.066)
n	369	430	405	403	426	437	421	423
Bandwidth	0.077	0.113	0.100	0.098	0.108	0.122	0.113	0.112

Coefficients are robust bias-corrected RDD estimates. The bandwidth represents the optimal bandwidth that minimizes mean-squared errors.

Robust standard errors shown in parentheses.

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

important for women's well-being and safety. These findings are consistent with and complement existing studies showing that women's political representation at the local level matters for the behavior and attitudes of citizens regarding gendered issues (Iyer et al., 2012; Kuipers, 2020; Beaman et al., 2009).

However, while our findings shed light on the effect of women's representation on VAW outcomes, the data does not allow us to test the specific mechanisms driving the reduction of violence. Further research is needed to identify *how* women politicians impact the prevalence of VAW. Uncovering the ways in which women politicians influence VAW has important policy implications for women's governance in other contexts as well. In addition, the evidence provided in this study is country-specific. Further research should be conducted in other contexts to more precisely identify the conditions that facilitate women politicians to positively address VAW.

We thus conclude that women's political representation in executive positions at the local level may be one important pathway to reduce VAW. Moreover, we find that women politicians not only reduce VAW, but that they reduce it more the longer they are in office. However, women's political representation is not a panacea: there are still significant barriers that must be confronted in comprehensively reducing VAW, including meaningful reforms of predominantly masculine institutions and political spaces. Nonetheless, in a world where a woman or girl is killed every 11 minutes (UN Women, 2022-02), women's political representation may be one important component to improving women safety.

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