

Women politicians reduce violence against women: Evidence from Mexico

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July 8, 2022

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; Franceschet et al., 2012; Piscopo; Córdova and Kras, 2022; García-Ramos, 2021; Brassiolo, 2016; Miller and Segal, 2019; Perova and Reynolds, 2017; Jassal, 2020; Artiz Prillaman, 2022; Volden et al., 2018; Barnes; Barnes and Holman; Barnes et al., 2021; Clayton and Zetterberg), 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.¹ 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 (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; Franceschet et al., 2012; Córdova and Kras, 2022; García-Ramos, 2021; Brassiolo,

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

2016; Miller and Segal, 2019; Perova and Reynolds, 2017; Jassal, 2020; Artiz Prillaman, 2022; Volden et al., 2018; Barnes; Barnes and Holman; Barnes et al., 2021; Clayton and Zetterberg). 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 engendered 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.

Case

To test the effects that women politicians have on VAW we use sub-national election and crime data from Mexico. Mexico provides an informative and illustrative case to test the effects of women's political representation on various VAW outcomes because women's representation is high (and increasing) and VAW is a particularly salient issue.

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; 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, women held almost 23% of mayoral positions in 2018 (INMUJERES, 2021) – increasing 20 percentage points over the last three decades (Vázquez García, 2010; Cárdenas Acosta, 2019). More broadly, the National Election Institute (*Instituto Nacional Electoral*) reported an average of 5.8 registered women candidates per race, with an estimated 7,600 women running for executive office during the 2018 election cycle (ONU Mujeres, 2018). This resulted in women politicians winning over 48% of the mayoral elections that were held in 2018 (ONU Mujeres, 2018). Methodologically, the large number of women elected at the local level in Mexico provides us with a sufficient sample size to test the effect of women politicians on VAW.

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 ten women a day being subject to the most intense forms of VAW – homicide and femicide (OECD, 2017). Moreover, due to its widespread prevalence, VAW is a highly politicized issue in Mexico; mass protests and wide media coverage focused on the issue are commonplace (Reuters, 2022).

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.

Mayors in Mexico provide an appropriate case to study this relationship because Mexico's federal system bestows considerable powers to local governments (Selee, 2012, 2011), including administering local services such as trash collection, road maintenance, provision of parks and libraries; overseeing business and real estate licensing; and having discretion over certain public expenditures. Importantly for VAW, most mayors in Mexico have some power over local law enforcement, including appointing the police chief, controlling public safety expenditure, and coordinating local policing efforts with state and federal authorities. Local governments can also implement projects meant to address social issues, which are usually part of the annual Municipal Development Plan. Mayors can therefore have direct influence on the policies and management of the everyday justice and security initiatives aimed at protecting women.

Mexican mayors serve for three years and typically start their terms towards the end of the election year. Mayors are elected by plurality rule and head municipal councils, which are responsible for making and enacting local policies. The party of the winning candidate also receives the relative majority of seats in the municipal council, giving mayors substantial *de jure* power. In practice, mayors also enjoy considerable *de facto* power (Selee, 2012, 2011). Mayors thus provide an appropriate case to assess how the election of women politicians can impact VAW.

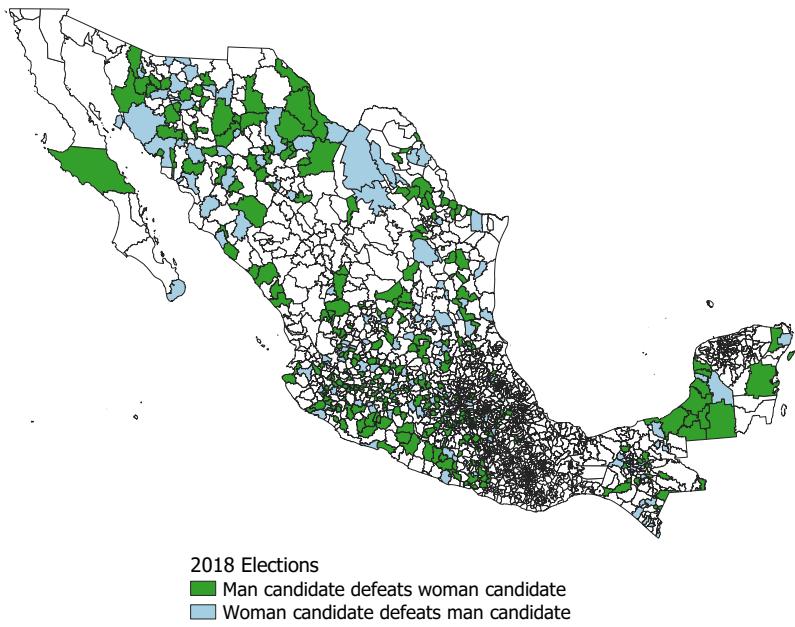


Figure 1: Geographic distribution of municipalities with elections in 2018 where either a woman candidate defeated a man candidate (shown in light blue) or a man candidate defeated a woman candidate (shown in green).

We collect data on the 1,324 local elections that took place in 2018 across 22 states,² 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.³ Using the electoral data, we calculate the winning margin for each election.

While the government provides the gender of the winning candidate that becomes mayor, the gender of candidates that do not win is not systematically collected or reported.⁴ 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.⁵ Figure 1 shows the geographic distribution of our sample; that is, the municipalities where elections took place in

²25 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.

³In 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.

⁴Some states do report this information, though rarely in a systematic manner, while others do not.

⁵Details on how gender was coded can be found in the *SI Appendix*.

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).

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

To capture the most egregious form of VAW we use three distinct measures of homi-

cides 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.⁶ 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](#); [Flores, 2021](#)). 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 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](#); [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-

⁶See Article 325 <https://www.gob.mx/conavim/articulos/que-es-el-femicidio-y-como-identificarlo>.

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.⁷ 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 τ , 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 τ 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, τ can be interpreted like a single-cutoff RDD design: the overall average of the local average treatment effect.⁸

Following the literature, we estimate bias-corrected first and second-order polynomials ([Calonico et al., 2014](#); [Gelman and Imbens, 2019](#)) using optimal bandwidths that 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](#)).⁹

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,

⁷We 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.

⁸See *SI Appendix* for more details.

⁹In 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.

suggesting there is no evidence of manipulation of the running variable.¹⁰ 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*.

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.

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

¹⁰Caughey 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.

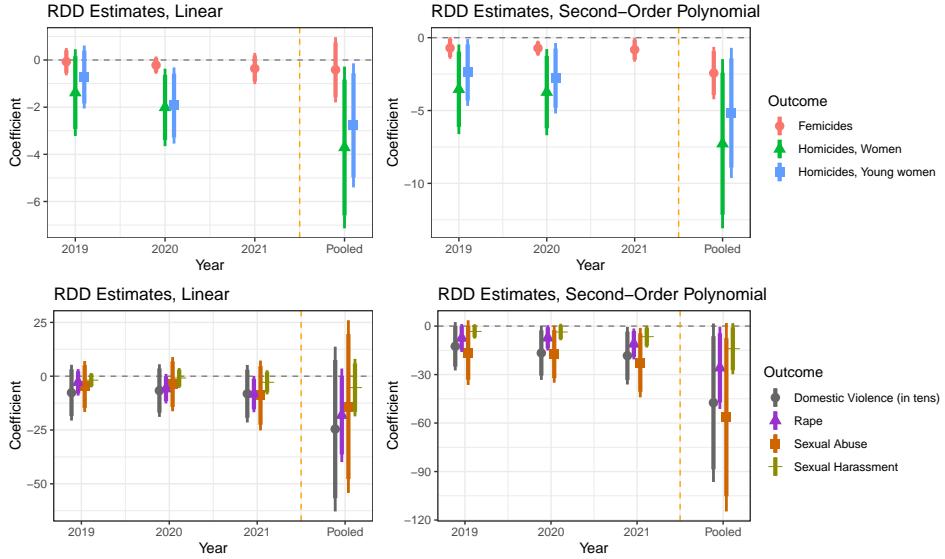


Figure 2: Regression discontinuity results of electing women politicians. Top row shows results for measures of homicides of women, and bottom row shows results for measures of reported VAW crimes. First column shows linear results and second column shows second-order polynomial results. 90% (thick lines) 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.

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.¹¹

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 $p < 0.05$ 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

¹¹These 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.

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	399	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

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 of municipal elections and a pre-registered causal research design, we find that women politicians that narrowly defeat men politicians 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 electing women politicians at the local level can reduce VAW, even in a context where many experts and activists argue that efforts to address VAW at the federal level are insufficient ([Farfán-Méndez, 2022](#)). 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 may be 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, for example, whether it is due to substantive representation (e.g., due to direct actions by women mayors targeting VAW) or symbolic representation that affects the behaviors of others (e.g., the criminal justice system, perpetrators, or citizens reacting and changing behavior due to a woman mayoral presence). 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 sub-national 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](#)), women's political representation may be one important component to improving women safety.

References

- S. Artiz Prillaman. She rules! a symposium on the political representation of women in india: When women's electoral representation matters, 2022.
- T. D. Barnes. *Gendering Legislative Behavior: Institutional Constraints and Collaboration*. Cambridge University Press. ISBN 978-1-107-14319-7. doi: 10.1017/CBO9781316534281. URL <https://www.cambridge.org/core/books/gendering-legislative-behavior/9813E4B82F72CDA2F7F5543A486010A9>.
- T. D. Barnes and M. R. Holman. Gender quotas, women's representation, and legislative diversity. 82(4):1271–1286. ISSN 0022-3816, 1468-2508. doi: 10.1086/708336. URL <https://www.journals.uchicago.edu/doi/10.1086/708336>.
- T. D. Barnes, V. D. Beall, and M. R. Holman. Pink-collar representation and budgetary outcomes in us states. *Legislative Studies Quarterly*, 46(1):119–154, 2021.
- L. Beaman, R. Chattopadhyay, E. Duflo, R. Pande, and P. Topalova. Powerful women: does exposure reduce bias? *The Quarterly journal of economics*, 124(4):1497–1540, 2009.
- C. Beer. Left parties and violence against women legislation in mexico. *Social Politics: International Studies in Gender, State & Society*, 24(4):511–537, 2017.
- M. E. Berry, Y. Bouka, and M. M. Kamuru. Implementing inclusion: Gender quotas, inequality, and backlash in kenya. *Politics & Gender*, 17(4):640–664, 2021. doi: 10.1017/S1743923X19000886.
- P. Brassiolo. Domestic violence and divorce law: When divorce threats become credible. *Journal of Labor Economics*, 34(2):443–477, 2016. doi: 10.1086/683666. URL <https://doi.org/10.1086/683666>.
- C. Cain Miller. Women actually do govern differently. *New York Times*, 2016.
- S. Calonico, M. D. Cattaneo, and R. Titiunik. Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica*, 82(6):2295–2326, 2014.
- S. Calonico, M. D. Cattaneo, and R. Titiunik. rdrobust: An R Package for Robust Nonparametric Inference in Regression-Discontinuity Designs. *The R Journal*, 7(1):38–51, 2015. doi: 10.32614/RJ-2015-004. URL <https://doi.org/10.32614/RJ-2015-004>.
- S. Calonico, M. D. Cattaneo, and M. H. Farrell. Optimal bandwidth choice for robust bias-corrected inference in regression discontinuity designs. *The Econometrics Journal*, 23(2):192–210, 11 2019. ISSN 1368-4221. doi: 10.1093/ectj/utz022. URL <https://doi.org/10.1093/ectj/utz022>.
- M. D. Cattaneo, R. Titiunik, G. Vazquez-Bare, and L. Keele. Interpreting regression discontinuity designs with multiple cutoffs. *The Journal of Politics*, 78(4):1229–1248, 2016.

- M. D. Cattaneo, M. Jansson, and X. Ma. Simple local polynomial density estimators. *Journal of the American Statistical Association*, 115(531):1449–1455, 2020. doi: 10.1080/01621459.2019.1635480. URL <https://doi.org/10.1080/01621459.2019.1635480>.
- D. Caughey and J. S. Sekhon. Elections and the regression discontinuity design: Lessons from close u.s. house races, 1942-2008. *Political Analysis*, 19(4):385–408, 2011. ISSN 10471987, 14764989. URL <http://www.jstor.org/stable/41403727>.
- CDC. Preventing intimate partner violence, 2021. URL <https://www.cdc.gov/violenceprevention/intimatepartnerviolence/fastfact.html>.
- A. Clayton. How do electoral gender quotas affect policy? *Annual Review of Political Science*, 24(1):235–252, 2021. doi: 10.1146/annurev-polisci-041719-102019. URL <https://doi.org/10.1146/annurev-polisci-041719-102019>.
- A. Clayton and P. Zetterberg. Quota shocks: Electoral gender quotas and government spending priorities worldwide. 80(3):916–932. ISSN 0022-3816, 1468-2508. doi: 10.1086/697251. URL <https://www.journals.uchicago.edu/doi/10.1086/697251>.
- R. Corley. Infographic | mexican women in politics. *Wilson Center*, 2022. URL <https://www.wilsoncenter.org/article/infographic-mexican-women-politics>.
- G. Cárdenas Acosta. El principio de paridad de género y el incremento de las presidentas municipales en México: análisis comparativo del periodo 2005-2017. *Debate feminista*, 57:83–107, 2019. ISSN 2594-066X. doi: 10.22201/cieg.2594066xe.2019.57.06. URL http://www.scielo.org.mx/scielo.php?script=sci_abstract&pid=S2594-066X2019000100083&lng=es&nrm=iso&tlang=es. Publisher: Universidad Nacional Autónoma de México.
- A. Córdova and H. Kras. State action to prevent violence against women: The effect of women’s police stations on men’s attitudes toward gender-based violence. *The Journal of Politics*, 84(1):1–17, 2022. doi: 10.1086/714931. URL <https://doi.org/10.1086/714931>.
- B. De la Cuesta and K. Imai. Misunderstandings about the regression discontinuity design in the study of close elections. *Annual Review of Political Science*, 19(1):375–396, 2016.
- Economic Commission for Latin America and the Caribbean (ECLAC). The pandemic in the shadows: femicides or feminicides in 2020 in latin america and the caribbean. 2021.
- K. Ellerby. *No Shortcut to Change*. New York University Press, 2017.
- C. Farfán-Méndez. Why Gender Violence in Mexico Persists—And How to Stop It. *Americas Quarterly*, May 22 2022. URL <https://www.americasquarterly.org/article/why-gender-violence-in-mexico-persists-and-how-to-stop-it/>.
- S. Flores. Las cifras oficiales de feminicidios en México no reflejan la realidad de este delito. *Animal Politico*, 2021. URL <https://www.animalpolitico.com/elsabueso/cifras-oficiales-de-feminicidios-en-mexico-no-reflejan-la-realidad/>.

- S. Franceschet, M. L. Krook, and J. M. Piscopo, editors. *The Impact of Gender Quotas*. Oxford University Press, 2012. ISBN 978-0-19-983009-1. doi: 10.1093/acprof:oso/9780199830091.001.0001. URL <https://oxford.universitypressscholarship.com/10.1093/acprof:oso/9780199830091.001.0001/acprof-9780199830091>.
- A. García-Ramos. Divorce laws and intimate partner violence: Evidence from mexico. *Journal of Development Economics*, 150:102623, 2021. ISSN 0304-3878. doi: <https://doi.org/10.1016/j.jdeveco.2020.102623>. URL <https://www.sciencedirect.com/science/article/pii/S030438782030198X>.
- A. Gelman and G. Imbens. Why high-order polynomials should not be used in regression discontinuity designs. *Journal of Business & Economic Statistics*, 37(3):447–456, 2019.
- M. Htun and S. L. Weldon. The civic origins of progressive policy change: Combating violence against women in global perspective, 1975–2005. *American Political Science Review*, 106(3):548–569, 2012.
- G. Imbens and K. Kalyanaraman. Optimal bandwidth choice for the regression discontinuity estimator. *Review of Economic Studies*, 79(3):933–959, 2012. URL <https://EconPapers.repec.org/RePEc:oup:restud:v:79:y:2012:i:3:p:933-959>.
- INMUJERES. Sistema de indicadores de género: Instituto nacional de las mujeres, 2021. URL http://estadistica-sig.inmujeres.gob.mx/formas/muestra_indicador.php?cve_indicador=259&Switch=1&Descripcion2=Distribuci%C3%B3n%20porcentual&indicador2=257&original=1&fuente=257.pdf&IDNivel1=2&IDTema=8#temas-section.
- Instituto Nacional de Estadística, Geografía y Informática. Censo de población y vivienda 2010. 2021a.
- Instituto Nacional de Estadística, Geografía y Informática. Mortalidad. 2021b.
- Instituto Nacional de Estadística y Geografía. Encuesta nacional sobre la dinámica de las relaciones en los hogares (endireh 2016) principales resultados, 2017.
- Inter-Parliamentary Union. Women in parliaments: World classification, 2022. URL <http://archive.ipu.org/wmn-e/arc/classif011218.htm>.
- L. Iyer, A. Mani, P. Mishra, and P. Topalova. The power of political voice: Women's political representation and crime in india. *American Economic Journal: Applied Economics*, 4(4):165–93, July 2012. doi: 10.1257/app.4.4.165. URL <https://www.aeaweb.org/articles?id=10.1257/app.4.4.165>.
- L. Jaitman and V. Anauati. The dark figure of crime in latin america and the caribbean. *Journal of Economics, Race, and Policy*, 3(1):76–95, 2019. ISSN 2520-8411, 2520-842X. doi: 10.1007/s41996-019-00042-0. URL <http://link.springer.com/10.1007/s41996-019-00042-0>.

- F. Jalalzai and M. L. Krook. Beyond hillary and benazir: Women’s political leadership worldwide. *International Political Science Review*, 31(1):5–21, 2010. doi: 10.1177/0192512109354470. URL <https://doi.org/10.1177/0192512109354470>. eprint: <https://doi.org/10.1177/0192512109354470>.
- N. Jassal. Gender, law enforcement, and access to justice: Evidence from all-women police stations in india. *American Political Science Review*, 114(4):1035–1054, 2020. doi: 10.1017/S0003055420000684.
- M. L. Krook. *Quotas for Women in Politics: Gender and Candidate Selection Reform Worldwide*. Oxford University Press, 2009. ISBN 978-0-19-537567-1. doi: 10.1093/acprof:oso/9780195375671.001.0001. URL <https://oxford.universitypressscholarship.com/10.1093/acprof:oso/9780195375671.001.0001/acprof-9780195375671>.
- N. Kuipers. The effect of electing female candidates on attitudes toward intimate partner violence. *The Journal of Politics*, 82(4):1590–1595, 2020. doi: 10.1086/708685. URL <https://doi.org/10.1086/708685>.
- J. Lovenduski. *Feminizing politics*. Polity, 2005.
- E. Magar. Recent mexican election vote returns repository, 2018. URL <https://github.com/emagar/elecReturns>.
- J. McCrary. Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of Econometrics*, 142(2):698–714, 2008. ISSN 0304-4076. doi: <https://doi.org/10.1016/j.jeconom.2007.05.005>. URL <https://www.sciencedirect.com/science/article/pii/S0304407607001133>.
- A. Miller and C. Segal. Do female officers improve law enforcement quality? effects on crime reporting and domestic violence. *Review of Economic Studies*, 86(5):2220–2247, 2019. URL <https://EconPapers.repec.org/RePEc:oup:restud:v:86:y:2019:i:5:p:2220-2247>.
- OECD. *Building an Inclusive Mexico: Policies and Good Governance for Gender Equality*. OECD Publishing, 2017. URL https://www.oecd-ilibrary.org.proxy.library.cornell.edu/social-issues-migration-health/building-an-inclusive-mexico_9789264265493-en;jsessionid=CpaHD_MVn36gTza9HfjgMv0b.ip-10-240-5-134.
- ONU Mujeres. Participación política de las mujeres a nivel municipal: Proceso electoral 2017-2018, 2018. URL https://mexico.unwomen.org/sites/default/files/Field%20ffice%20Mexico/Documentos/Publicaciones/2019/Participacin%20Politica%20de%20las%20Mujeres%20a%20Nivel%20Municipal_Proceso%20Electoral%202017_2018.pdf.
- E. Perova and S. Reynolds. Women’s police stations and domestic violence: Evidence from brazil. *Social Science and Medicine*, 174:188–196, 2017.
- J. M. Piscopo. Beyond hearth and home: Female legislators, feminist policy change and substantive representation in mexico. 23(2):87–110.

- Reuters. Mexican women protest femicides as president warns against violence. *The New York Times*, Mar 2022. URL <https://www.nytimes.com/2022/03/09/world/americas/mexico-women-femicides.html>.
- C. Sarah and L. K. Mona. Critical mass theory and women's political representation. *Political Studies*, 56(3):725–736, 2008. doi: 10.1111/j.1467-9248.2007.00712.x. URL <https://doi.org/10.1111/j.1467-9248.2007.00712.x>.
- Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública. Incidencia delictiva. 2022.
- SEGOB, INMUJERES, and ONU Mujeres. La violencia feminicida en México, aproximaciones y tendencias 1985-2016. 2017.
- A. Selee. *Decentralization, democratization, and informal power in Mexico*. Penn State University Press, 2011.
- A. Selee. Municipalities and policymaking. In R. Ai Camp, editor, *The Oxford Handbook of Mexican Politics*. Oxford University Press, 2012.
- C. Torreblanca. ¿qué contamos cuando contamos “feminicidios”? *Animal Político*, 2018. URL <https://www.animalpolitico.com/el-foco/que-contamos-cuando-contamos-feminicidios/>.
- UN Women. Facts and figures: Ending violence against women, 2022. URL <https://www.unwomen.org/en/what-we-do/ending-violence-against-women/facts-and-figures>.
- United Nations. Declaration on the elimination of violence against women, 1993. URL <http://research.un.org/en/docs/ga/quick/regular/48>.
- C. Volden, A. E. Wiseman, and D. E. Wittmer. When are women more effective lawmakers than men? *American Journal of Political Science*, 57(2):326–341, 2013.
- C. Volden, A. E. Wiseman, and D. E. Wittmer. Women's issues and their fates in the us congress. *Political Science Research and Methods*, 6(4):679–696, 2018.
- V. Vázquez García. Women and municipal governments in mexico: What do we know? what do we still need to know? *Gestión y política pública*, 19(1):111–154, 2010. ISSN 1405-1079. URL http://www.scielo.org.mx/scielo.php?script=sci_abstract&pid=S1405-10792010000100004&lng=es&nrm=iso&tlang=es.
- World Health Organization. Devastatingly pervasive: 1 in 3 women globally experience violence, 2021. URL <https://www.who.int/news/item/09-03-2021-devastatingly-pervasive-1-in-3-women-globally-experience-violence>.