

# World Cup, Rape, and Domestic Violence

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## Abstract

Does the FIFA World Cup have an effect on crimes against women? To answer this question, we study the case of the 2018 FIFA Men's World Cup for Mexico City, using official police reports data for domestic violence and rape. We track weekly changes in the rates of crime targeting women, employing an event-study design. The 2018 World Cup began on June 14. Mexico started the tournament with a surprise 1-0 win against Germany, the latest world champion. In the second match of the first round, Mexico defeated South Korea 2-1. By then, Mexico's national team appeared set to win one of the toughest groups in the tournament. However, Mexico ended up losing against Sweden 3-0. Our results show that rape rates increased by 12% the week Mexico lost against Sweden. Yet, we do not observe a decrease on crimes against women when Mexico defeated Germany or South Korea. These results support the loss aversion hypothesis, which proposes that the pain of losing is larger than the pleasure of gaining.

**Keywords:** domestic violence; rape; World Cup; Latin America; Mexico

# 1 Introduction

Every four years the FIFA World Cup tournament attracts millions of people around the world to watch the attempt of their national team to win the ultimate football soccer trophy. In that regard, sports serve as a valuable source of identity in social groups and communities. The act of gathering to watch sports creates a shared sense of membership that facilitates intra-group trust and cooperation (Neville and Reicher, 2011). However, as exciting and unifying these events are, scholars warn about a high relation between these popular sport tournaments and rising crimes against women (Trendl et al., 2021). While the sport itself does not cause violence, the increase in alcohol consumption and the charged emotions are potential risk factors for gender-related crimes including domestic violence (Brimicombe and Cafe, 2012).

This paper analyzes the impact of the 2018 World Cup on domestic violence and rape in Mexico City. This city is the capital of Mexico, and the largest urban area in the country. In Mexico, women face high rates of domestic violence and sexual crimes. Every year, 25% of women undergo domestic violence. Additionally, in Mexico occurs 60 sexual assaults against women every 24 hours (Angel, 2017). We use police reports from Mexico City's Attorney General's Office to investigate how the World Cup affects domestic violence and rape from week one until week 29 of 2017 and 2018. We employ an event-study design to capture changes in the rates of crime against women before and during the 2018 World Cup. Our methodology allows us to control for seasonality and to understand the dynamics of the effects during Mexico's games.

The 2018 World Cup began on June 14 (week 24 of 2018). Mexico started with a surprise 1-0 win against Germany. This was the first time that Mexico defeated Germany in this tournament. Then, Mexico won 2-1 against South Korea. Based on these results, Mexico appeared set to be in first place in one of the toughest groups in the tournament. However, Mexico ended up losing against Sweden 3-0. This result left Mexico in the second place of the group, meaning that Mexico had to face the five-time World Cup champions Brazil. And with this result, Mexico basically eliminated

its aspirations to continue in the tournament.

Our results show that rape rates increased by 12% the week Mexico lost against Sweden. Nevertheless, we do not observe a decrease in the rates of crimes against women when Mexico defeated Germany or South Korea. These results support the loss aversion hypothesis which proposes that the pain of loosing is larger than the pleasure of gaining (Kahneman and Tversky, 1979). These results are robust to alternative specifications, including a wild-cluster bootstrap procedure, and excluding population weights.

The findings of this study add to the knowledge on football and crimes against women (Brimicombe and Cafe, 2012; Card and Dahl, 2011; Dickson et al., 2015; Gantz et al., 2012; Kirby et al., 2014; Montolio and Planells, 2015; Sachs and Chu, 2000; Trendl et al., 2021; Williams et al., 2013). First, our results support the hypothesis that sports can affect risk factors associated with crime against women such as emotions and expectations. Second, to our knowledge, this is one of the first studies to look into the impact of the World Cup on rape. Most of the existing literature focuses on domestic violence. Also, many papers assume that men watch sports through a TV within the households. Yet, there is a trend for displaying football games on large screens in public bars (Kirby et al., 2014). This new trend potentially increases the likelihood for victim-to-criminal interactions which ultimately can end up affecting the amount of rapes.

The rest of this paper continues as follows. The available literature on the link between football and crimes against women is reviewed in Section 2. Section 3 discusses the particular background of Mexico's performance in the 2018 FIFA World Cup, as well as other specific details such as viewership and alcohol consumption during the event. The data and empirical strategy are described in Section 4. The results and implications of the findings are presented in sections 5 and 6, respectively. Section 7 concludes.

## 2 Sports and Crime Against Women

### 2.1 Sports and Violence

While the World Cup does not create violence in and of itself, there are risk variables that enhance the probability of crimes against women. The World Cup can affect the rate of crimes against women through the media, alcohol consumption, fans' emotions, and expectations. First, many men follow sports through TV broadcasts. Television content influence behaviors and attitudes such as acceptability of domestic violence (Jensen and Oster, 2009). During international football tournaments, the media presents narratives that use war references and national identity (Vincent and Harris, 2013). This situation can impact male fans to express dominance, and thus more domestic violence (Trendl et al., 2021).

Second, there is evidence of a correlation between watching soccer and alcohol consumption. In fact, alcohol consumption is becoming an important feature of the spectator experience. Durbeej et al. (2017), using data from the Swedish Premier Football League, find that half of the spectators drink alcohol when watching sports. Furthermore, Foran and O'Leary (2008) claim that drinking alcohol increases people's violent conduct, which can translate into more crimes against women such as domestic violence. While alcohol cannot cause domestic violence, there seems to be an association, even though the empirical evidence remains mixed on the actual relation. Using data from the United States, Markowitz (2000) shows that a 1% rise in the price of alcohol results in a 3% drop in domestic violence. Durrance et al. (2011), on the other hand, find no effect of alcohol taxes on female murders in the United States.

Third, the result of the match can affect fans' emotions as well as their behavior. Usually fans are happy, optimistic, and full of pride when their team performs well. However, if their team is defeated, the opposite happens (Bernhardt et al., 1998). This change in emotions can affect their behavior, and the likelihood of committing crimes

against women.

Fourth, expectations in sports can also play a significant influence in terms of aggression, particularly if fans manifest certain psychological biases. Namely, the loss aversion hypothesis suggests that the pain associated with a loss is greater than the pleasure associated with a similar-sized gain (Kahneman and Tversky, 1979). And, when individuals determine losses, the expectations play an important role (Card and Dahl, 2011). In the case of sports, if fans expect a victory, but their team loses, then it affects negatively their emotions, even more so than if they were expecting a loss. And, this negative emotional shock can translate into violence.

## 2.2 Football Soccer and Domestic Violence

The idea of a correlation between football soccer and domestic violence continues to gain prominence since the 2010 FIFA World Cup, when media in the United Kingdom (UK) started publishing warning ads about an increased risk in domestic violence during the tournament (Brimicombe and Cafe, 2012). Using data from England's participation in the 2010 World Cup, Brimicombe and Cafe (2012) find a 10-16 percent rise in intimate partner violence regardless of whether England wins or loses. Further, Kirby et al. (2014) analyze the 2002, 2006, and 2010 World Cups in the UK. They confirm that the World Cup increases domestic violence regardless of the outcomes from the national football team. However, they find that a loss from England causes a greater rise in domestic violence (38%), whilst a victory or draw has a somewhat lesser impact (26%). Montolio and Planells (2015), using data from Barcelona football club's games, also find that domestic violence is more prevalent after the Barcelona is defeated.

Other authors study the effect of football soccer matches on domestic violence, using the Scottish league. Specifically, these authors use what is known as the "Old Firm" matches, where the two Glasgow-based football teams (Rangers and Celtics) play each other. For instance, Williams et al. (2013) find a significant increase in domestic vio-

lence reports after “Old Firm” matches. [Dickson et al. \(2015\)](#) test the loss aversion hypothesis among football fans in Glasgow, concluding that domestic violence is not connected to poor performance compared to expectations. The only exception is when the matches take place at the conclusion of the season, when the championship is still up for grabs.

Using data spanning over ten years (2010 to 2019), [Trendl et al. \(2021\)](#) examine alcohol-related domestic abuse during England’s international football competitions. They find that following an England football victory, the number of domestic violence incidents related to alcohol consumption rises by 47%. However, these findings do not hold under a draw or loss event.

### **2.3 American football and domestic violence**

An extension of the previous literature studies the effects of American football games on domestic violence. [Sachs and Chu \(2000\)](#) explore the effect of the Raiders and Rams’s games on domestic violence in Los Angeles, and they find no effects. [Gantz et al. \(2012\)](#) increases the sample by expanding the study to include 15 cities, finding only small significant effects on domestic violence (3.5 additional domestic violence incidents during game days). [Card and Dahl \(2011\)](#) attempt a new approach, which estimates the impact of the expected outcome of the game and the actual outcome of the game on incidents of intimate partner violence. They show that unexpected losses result in a 10% rise in intimate partner violence, while expected losses and upset wins have small and insignificant effects.

Overall, there is not a unified theory regarding football and crime against women. Some hypotheses suggest that sports such as soccer and American football can impact crime against women through media, alcohol consumption, emotions, and expectations. From the evidence, we observe the following patterns in the literature: (1) the evidence does not support the emotional hypothesis. In particular, we should expect that in the face of defeat the violence will increase, but in the face of victory the vio-

lence will decrease. Yet, the evidence from England shows that the violence increase regardless the result of the game, (2) there is mixed evidence regarding the expectations (loss aversion) hypothesis, and (3) there is evidence in favor of the alcohol hypothesis when using data from England.

## 3 Background

### 3.1 Mexico's Performance in Russia's 2018 FIFA World Cup

The 2018 FIFA World Cup began on June 14 (week 24 of 2018), being the most watched World Cup in history, as of 2018, with over 3.572 billion people tuning in to the official live broadcasts over the course of the tournament (FIFA, 2018). As mentioned above, Mexico kicked off its participation with a surprise 1-0 win against Germany. According to FiveThirtyEight (2018), which employs Soccer Power Index ratings, the probability of Mexico winning that match was only 0.1537, while the probability of Germany winning was 0.6276 (tie game probability was 0.2187). After all, Mexico was playing against the 2014 World Cup champion. In fact, this was the first time that Mexico defeated Germany in a World Cup. An important feature of this game is that it was the most watched match of the first round, and the sixth most watched game in the whole tournament (out of 64 matches), with a global live audience of 289.5 million (FIFA, 2018). This boosted the expectations of Mexico's fans, as it gain a lot of traction around the world (see below).

In the second match of the first round, Mexico beat South Korea 2-1. At the time, the national teams of Mexico and South Korea had played 14 games with a result for Mexico of eight wins, two draws, and four losses. Hence, Mexico's victory did not come as a surprise. As a matter of fact, the odds of Mexico winning were 0.5478 against the 0.1863 probability of South Korea winning (tie game probability was 0.2659) (FiveThirtyEight, 2018). Based on these results, Mexico appeared set to be first in one of the toughest groups in the tournament, meaning that Mexico would

play against an easy team during the second round of the tournament, in this case against Switzerland. However, Mexico ended up losing against Sweden 3-0, with all three goals happening during the second half of the game. The chances of Mexico winning against Sweden were 0.3383, while Sweden's odds were very similar at 0.3662 (tie game probability was 0.2955) (FiveThirtyEight, 2018). The final score left Mexico in the second place of the group, meaning that Mexico had to face the five-time World Cup champions Brazil, top championship winner in history. And with this result, Mexico basically eliminated its aspirations to continue in the tournament, as the odds of Mexico winning were only 0.1781 against the 0.8219 probability of Brazil winning (FiveThirtyEight, 2018).

### 3.2 Viewership and Alcohol Consumption in Mexico

Football soccer is the most followed sport in Mexico. Over 76% of Mexicans are football soccer fans and 90% of all Mexicans follow Mexico's national football soccer team (Nielsen-Ibope, 2019). This attracts most households in the country to watch the most important football soccer tournament every four years: the FIFA World Cup. According to Nielsen-Ibope (2019), over 80% of Mexicans watched the 2018 edition of the World Cup. Interestingly, 44.5% of all Mexicans expected Mexico's national team to win the World Cup that year. In fact, this caused 33% of all Mexicans to follow more closely the 2018 edition of the World Cup than previous ones (Nielsen-Ibope, 2019). The three Mexico's matches of the first round of the 2018 World Cup were the most watched programs in the year, surpassing ratings such as the Super Bowl LII (12.9M), the final match of the Mexican Football Soccer League (12.77M), or even the final game of the World Cup (12.3M) (Nielsen-Ibope, 2019). Namely, the views ratings for the Mexico-Germany match were 15.9M; for the Mexico-Korea, 15M, and for the Mexico-Sweden, 14M (Nielsen-Ibope, 2019). It is worth mentioning that in the Mexico-Sweden match, other games were happening at the same time to define the second-round matches. In all, the previous provides very little variance in terms of



viewership, as the three matches had very high ratings.

Another important aspect to consider is that alcohol beverage purchases increased 35% during the 2018 World Cup, particularly during the weekends in which Mexico had a game (the Mexico-Germany and Mexico-Korea matches happened over the weekend while the Mexico-Sweden game, on a Wednesday) (Nielsen-Ibope, 2019). Although we do not have daily data on alcohol beverage consumption, we have data on manufacturing sales that include alcoholic and non-alcoholic beverages, as well as tobacco. Most important, we have manufacturing sales data for Mexico City, which is the geographical demarcation of the present study. Figure A1 in the Appendix section shows that there is a peak on sales for the beverage and tobacco industry right at the time when the 2018 World Cup began. That means that there was a higher demand for products within the industry, including alcoholic beverages, than in the immediate previous year (2015, 2016, and 2017).

## 4 Data and Methods

### 4.1 Data

We use administrative data from official police reports from the Attorney General's Office in Mexico City for 2017 and 2018 to calculate the impact of World Cup on domestic violence and rape. The Attorney General's Office publishes a monthly report on the number of cases under its jurisdiction. We generate rates per 100,000 inhabitants for domestic violence and rape per week for the 16 districts into which Mexico City is divided. We use data from week 1 to week 29 for 2017 and 2018. The data for 2017 controls for seasonal changes. There are 928 observations in our final sample (16 districts x 29 weeks x 2 years).

Table 1 presents descriptive statistics for rape and domestic violence cases per 100,000 people in Mexico City from 2017 to 2018. Domestic violence is the most common form of violence, with 4.37 incidents per 100,000 people. In the case of rape, the

reporting rate is 0.15 incidences per 100,000 people per week.

## 4.2 Methods

To analyze the effects of the 2018 World Cup on rape and domestic violence, we use the following event-study specification:

$$Y_{mty} = \alpha + \sum_{\substack{q=-5 \\ q \neq -1}}^5 \beta_q \text{WorldCup}_{mqy} + \beta_m + a_t + \gamma_y + u_{mty} \quad (1)$$

where  $Y_{mty}$  denotes the dependent variable (logarithm of the rates per 100,000 inhabitants for domestic violence or rape) for district  $m$ , week  $t$ , and year  $y$ .  $\text{WorldCup}_{mqy}$  is a dichotomous variable. It takes the value of one for each week  $q$  before and after the the World Cup's inauguration for district  $m$  in 2018. In particular, the World Cup begins in June 14 (week 24). This week is represented by  $q = 0$  in the equation above.  $q = 5$  represents five weeks after the World Cup started (week 29).  $q = -1$  represents one week before the World Cup (week 23). In addition,  $q = -4$  corresponds to four weeks before the World Cup (week 20).  $q = -5$  groups all the weeks that correspond to five weeks or more before the World Cup started in 2018 (weeks 1 to 19). Notice that  $\beta_q$  represents the percentage change of the 2018 World Cup on rape and domestic violence rates, resulting from using a log-linear functional form. Finally, we control for district-fixed effects ( $\beta_m$ ), weekly fixed-effects ( $a_t$ ), and year fixed-effects ( $\gamma_y$ ). The standard errors are clustered at the district level. The regression is weighted by the district-level population.

## 5 Results

### 5.1 Results

The event-study results for the effects of the 2018 World Cup on domestic violence and rape are presented in Figure I and Table A.1. The solid lines indicate the changes in the variable of interest following the start of the World Cup, which occurs at  $q = 0$ . The confidence intervals around the point estimations are shown by the dashed lines.

The first panel shows the results for domestic violence. These plotted points suggest that domestic violence decreased the first week (week zero in the event-study), right when the World Cup started and Mexico defeated Germany 1-0. Namely, the rate of domestic violence decreases by 13.5 percentage points. This decrease in domestic violence, however, isn't statistically significant.

The results regarding rape are presented in the second panel. These plotted points suggest no change on the rate of rape during the first two weeks of the World Cup (weeks 0 and 1 in the event-study). Nonetheless, we observe that the rate of rape increases by 12 percentage points the third week of the World Cup, when Mexico lost against Sweden (week 2 in the event-study). This result placed Mexico second in its classification group, and as a consequence, Mexico had to play against Brazil (top championship winner) in the next round. The previous result left fans' with lower expectations of classifying to quarter-finals.

### 5.2 Robustness Checks

We investigate various alternative specifications to see if our findings are robust. First, we use a wild-cluster bootstrap approach. Second, we take one district out of the analysis at a time. Third, the main findings are reproduced without population weights. Fourth, we use a different functional form. Fifth, we use a placebo test. Last, we use a multiple hypothesis testing.

The first test for robustness consists of using wild cluster standard errors to look for probable biases in the standard errors estimated in the main specification. [Cameron et al. \(2008\)](#) suggest that with a small number of clusters (less than 30), standard errors can be biased. They suggest to correct the standard errors using a wild cluster bootstrap procedure. Table [A.2](#) presents the results using this methodology. In the case of rape for the third week of the World Cup (or week 2 in the event-study), the confidence interval using wild cluster standard errors is: [0.02, 0.21]. Thus, the wild cluster standard errors confirm the main result.

The second test consist of taking one district out of the analysis at a time. By excluding one district at a time, we can see if our findings are sensible to an outlier or a policy change at the district level. The results are presented in Table [A.3](#). For the case of rapes, the significance of the effect on the third week remains after excluding one municipality at a time.

In our third robustness check, we remove the population weights. These weights are used to take into account the size of the municipality. Figure [A2](#) depicts these robustness results. Despite removing the population weights, we observe that the coefficient associated to rape in the third week continues to be statistically significant.

In our fourth robustness check, we analyze the sensibility of our results using a different functional form. As described above, our main specification uses the logarithm of the rates of crimes against women in order to have a clearer interpretation of our results. However, the results can be a consequence of using a log-linear functional form. To reduce this concern, we estimate Equation [1](#) using the rate of crimes per 100,000 inhabitants. Figure [A3](#) shows the results. The coefficients associated with domestic violence and rape follow the same patterns as in the main specification.

Our fifth robustness check conducts a placebo test using data from 2016 and 2017. For this check, we assume that the World Cup started in the week 24 of 2017. The specification also reflects Equation [1](#). Unless there is unanticipated seasonality or other omitted variables, the placebo test should show no change in our variables of interest.

Figure A4 depicts the results for this placebo test. As expected, the coefficients associated with domestic violence and rape are not statistically significant in the placebo.

Finally, we use sharpened False Discovery Rate q-values to do a multiple testing correction to lower the risk of false rejections (Anderson, 2008). Table A.4 shows the results. The sharpened q-values are presented in brackets, and the p-values in parenthesis. We do not observe important differences between the q and p-values. This confirms that the coefficient associated with rape in week 2 is statistically significant.

## 6 Discussion

Our results suggest that the 2018 World Cup impacted the levels of rape but not of domestic violence. The World Cup may affect crimes against women through alcohol consumption, emotions, and expectations. Regarding alcohol, Trendl et al. (2021) find that during national football soccer tournaments in England, the increase in domestic abuse is associated with alcohol consumption. Yet, this increase is observed only when England wins. That is, there are no effects when England draws or loses. In the case of Mexico, one limitation of our data, is that we can not differentiate between alcohol and non-alcohol related crimes nor we can incorporate weekly alcohol consumption data in our empirical strategy. Even so, if domestic violence increases when the football national team wins, we should expect a rise on domestic violence in the opening week of the tournament when Mexico defeated Germany. However, we do not find evidence of an increase on domestic violence during that week.

In the case of emotions, it is assumed that when the fan's team win we should observe a decrease on crimes against women. If their team loses, the opposite should happen (Bernhardt et al., 1998). When Mexico wins, we see a drop in domestic violence, but this is not statistically significant. Furthermore, when Mexico defeats South Korea, we do not see a decrease in domestic violence.

An alternative explanation for our results is the hypothesis based on loss aversion

and expectations. In particular, this hypothesis proposes that if individuals expect a victory, but their team losses, then it affects negatively their emotions. Yet, an unexpected win of the same magnitude has no effect. Mexico was not expected to win against Germany, but when Mexico win against Germany we do not see an effect on domestic violence or rape. In the second game, it was expected that Mexico defeat South Korea, and this result was confirmed. Then, given that Mexico has won its first two games, it generates the expectation that Mexico will win the third game against Sweden. But, Mexico lost and we observe an increase on rape. Finally, it was expected that Mexico lost against Brazil as it happens. And, we do not see any impact on domestic violence or rape.

Our results suggest that unexpected lost can impact rape. Yet, why we do not observe an increase on domestic violence when Mexico lost against Sweden? One potential explanation is related to the day when Mexico played the games. In the case of the Mexico vs Germany, this was played on Sunday. When it is expected many men are watching the game within their households. In the case of the Mexico vs Sweden game, it was played on Wednesday. A day when many of the men are not in their houses. This suggests that the results can be influenced also by the day when the game is played.

## 7 Conclusion

The impact of the 2018 World Cup on domestic violence and rape in Mexico City is examined in this paper. To explore whether the World Cup affected domestic violence and rape, we employ data from official police reports. Using an event-study design, we find that rape reports increased with an unexpected defeat of Mexico, while there was no effect on domestic violence.

These results suggests that an unexpected game result is an important factor for crimes against women. While it has been studied the relationship between football (American and soccer) and domestic violence, our results provide evidence that women can be victims of other crimes such as rape.

Policymakers should pay attention to these unexpected results and protect women from potential crimes during future editions of the World Cup. Also, there is suggestive evidence that television can change individual's behavior. Advertisement to reduce crime against women during the World Cup televised games should be considered. In addition, policymakers can provide information to women about the potential risks of rape whenever a local team loses in order to decrease the risk of a criminal-victim encounter during game days.

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## 8 Figures and Tables

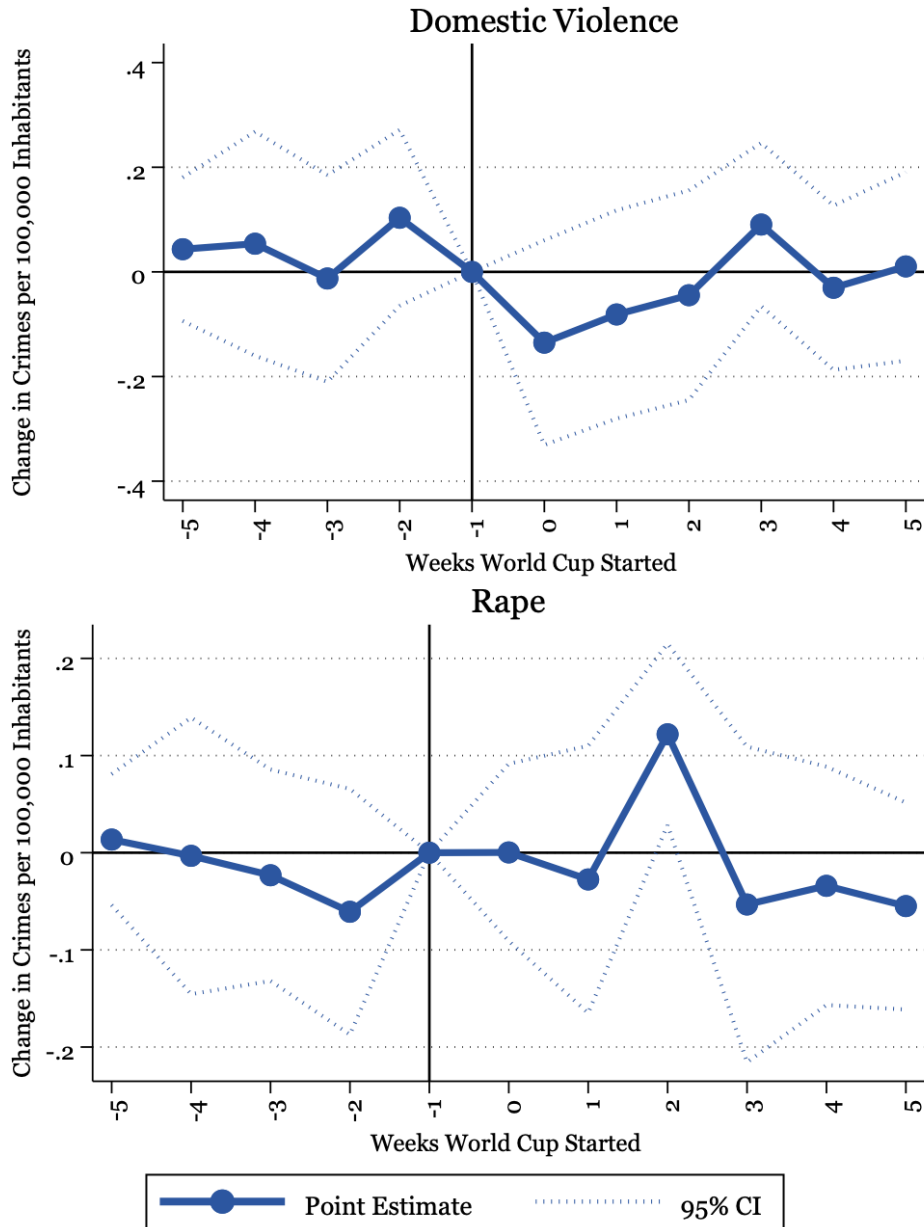
Table 1: Descriptive Statistics (Rate per 100,000 Persons)

	Mean	Std. Dev.	Min	Max
Domestic Violence	4.37	1.57	0	13
Rape	0.15	0.22	0	2
Observations	928			

SOURCE: Attorney General's Office.

NOTES: Mean represents average values for the 16 districts in our sample.

Figure I: Main Results



SOURCE: Attorney General's Office.

NOTES: The point estimations represent the coefficients calculated,  $\beta_{qt}$ , using the event study specification. The confidence intervals around the point estimations are shown by the dashed lines. Standard errors are clustered at the district level.

## A Appendix

Table A.1: Event-Study Specification

	(1) Domestic Violence	(2) Rape
Week -5	0.043 (0.065)	0.014 (0.032)
Week -4	0.054 (0.101)	-0.003 (0.067)
Week -3	-0.013 (0.093)	-0.023 (0.051)
Week -2	0.103 (0.079)	-0.061 (0.060)
Week 0	-0.135 (0.093)	0.000 (0.043)
Week 1	-0.081 (0.094)	-0.028 (0.065)
Week 2	-0.045 (0.095)	0.122** (0.044)
Week 3	0.090 (0.074)	-0.053 (0.077)
Week 4	-0.030 (0.074)	-0.034 (0.058)
Week 5	0.011 (0.085)	-0.055 (0.050)
Municipality FE	Yes	Yes
Week FE	Yes	Yes
Year FE	Yes	Yes
$R^2$	0.46	0.39
Observations	928	928

SOURCE: Attorney General's Office.

NOTES: Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

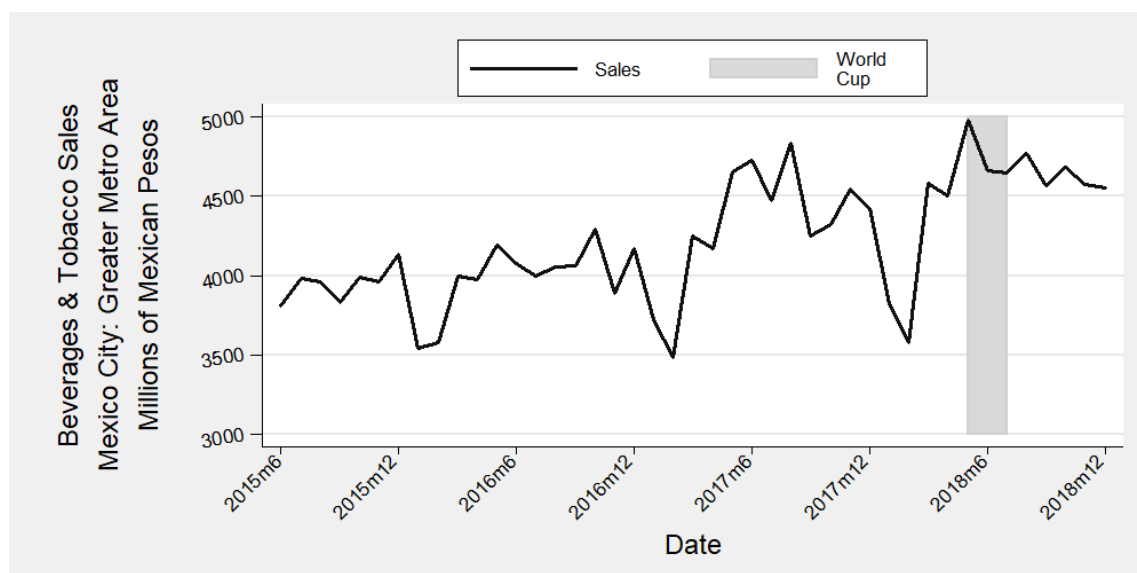
Table A.2: Wild Bootstrap Standard Errors

	(1) Domestic Violence	(2) Rape
Week -5	[-0.09, 0.20]	[-0.05, 0.08]
Week -4	[-0.15, 0.29]	[-0.17, 0.13]
Week -3	[-0.21, 0.22]	[-0.16, 0.07]
Week -2	[-0.08, 0.27]	[-0.20, 0.05]
Week 0	[-0.36, 0.04]	[-0.11, 0.08]
Week 1	[-0.32, 0.09]	[-0.19, 0.11]
Week 2	[-0.31, 0.13]	[ 0.02, 0.21]
Week 3	[-0.10, 0.23]	[-0.22, 0.14]
Week 4	[-0.20, 0.14]	[-0.16, 0.07]
Week 5	[-0.19, 0.20]	[-0.17, 0.05]
Municipality FE	Yes	Yes
Week FE	Yes	Yes
Year FE	Yes	Yes
$R^2$	0.46	0.39
Observations	928	928

SOURCE: Attorney General's Office.

NOTES: Intervals in squares are the wild bootstrap standard errors.

Figure A1: Beverages and Tobacco Sales in Mexico City Metro Area



SOURCE: NATIONAL MANUFACTURING MONTHLY SURVEY (EMIM) 2015-2018, INSTITUTO NACIONAL DE ESTADÍSTICA Y GEOGRAFÍA.

NOTES: INCLUDES ALCOHOLIC BEVERAGES, NON-ALCOHOLIC BEVERAGES, AND TOBACCO SALES.

Table A.3: Sensitivity Analysis Excluding a Municipality

		Domestic Violence															
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Week -5		0.064 (0.065)	0.046 (0.068)	0.034 (0.069)	0.045 (0.067)	0.059 (0.067)	0.005 (0.060)	0.027 (0.066)	0.064 (0.078)	0.044 (0.067)	0.058 (0.066)	0.037 (0.066)	0.028 (0.068)	0.029 (0.066)	0.052 (0.068)	0.032 (0.067)	0.071 (0.064)
Week -4		0.069 (0.106)	0.028 (0.102)	0.046 (0.109)	0.052 (0.104)	0.100 (0.099)	0.002 (0.096)	0.046 (0.106)	0.107 (0.112)	0.055 (0.105)	0.058 (0.106)	0.040 (0.102)	0.040 (0.108)	0.046 (0.105)	0.041 (0.105)	0.039 (0.105)	0.098 (0.102)
Week -3		-0.009 (0.099)	0.006 (0.098)	-0.036 (0.095)	-0.029 (0.093)	0.001 (0.100)	-0.046 (0.097)	-0.025 (0.096)	0.051 (0.095)	-0.020 (0.095)	-0.020 (0.097)	-0.015 (0.095)	-0.019 (0.101)	-0.035 (0.093)	0.002 (0.099)	-0.031 (0.095)	0.034 (0.094)
Week -2		0.099 (0.084)	0.108 (0.084)	0.120 (0.084)	0.111 (0.081)	0.123 (0.082)	0.134 (0.084)	0.082 (0.080)	0.067 (0.089)	0.096 (0.082)	0.118 (0.082)	0.100 (0.081)	0.081 (0.083)	0.080 (0.080)	0.114 (0.083)	0.080 (0.080)	0.140* (0.076)
Week 0		-0.099 (0.086)	-0.124 (0.096)	-0.133 (0.100)	-0.149 (0.095)	-0.125 (0.097)	-0.174 (0.101)	-0.141 (0.097)	-0.182 (0.105)	-0.115 (0.091)	-0.112 (0.092)	-0.152 (0.094)	-0.140 (0.101)	-0.156 (0.096)	-0.134 (0.097)	-0.145 (0.098)	-0.090 (0.083)
Week 1		-0.065 (0.095)	-0.065 (0.095)	-0.115 (0.099)	-0.066 (0.093)	-0.075 (0.100)	-0.084 (0.109)	-0.109 (0.098)	-0.151 (0.094)	-0.065 (0.094)	-0.079 (0.098)	-0.081 (0.096)	-0.100 (0.103)	-0.084 (0.099)	-0.058 (0.093)	-0.045 (0.086)	-0.072 (0.101)
Week 2		-0.018 (0.093)	-0.017 (0.093)	-0.042 (0.102)	-0.033 (0.095)	-0.025 (0.097)	-0.098 (0.096)	-0.081 (0.095)	-0.075 (0.116)	-0.041 (0.097)	-0.026 (0.096)	-0.042 (0.096)	-0.073 (0.101)	-0.053 (0.100)	-0.052 (0.100)	-0.035 (0.098)	-0.012 (0.094)
Week 3		0.121* (0.068)	0.073 (0.077)	0.110 (0.075)	0.107 (0.072)	0.114 (0.072)	0.063 (0.082)	0.100 (0.076)	0.058 (0.087)	0.096 (0.075)	0.074 (0.077)	0.092 (0.075)	0.072 (0.079)	0.095 (0.077)	0.077 (0.078)	0.078 (0.078)	0.111 (0.075)
Week 4		-0.011 (0.074)	-0.023 (0.077)	-0.032 (0.080)	-0.035 (0.076)	-0.008 (0.074)	-0.088 (0.060)	-0.042 (0.078)	-0.036 (0.094)	-0.017 (0.075)	-0.005 (0.071)	-0.039 (0.076)	-0.026 (0.080)	-0.051 (0.076)	-0.032 (0.078)	-0.025 (0.078)	-0.019 (0.079)
Week 5		0.037 (0.084)	0.041 (0.083)	-0.019 (0.087)	0.024 (0.086)	0.010 (0.091)	-0.039 (0.082)	0.018 (0.089)	0.026 (0.105)	0.017 (0.088)	0.014 (0.089)	0.011 (0.087)	-0.018 (0.088)	-0.006 (0.088)	0.016 (0.089)	-0.007 (0.088)	0.039 (0.087)
Baseline FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.48	0.47	0.47	0.48	0.43	0.44	0.45	0.49	0.45	0.45	0.45	0.48	0.47	0.47	0.48	0.46	0.46
Observations	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870

		Rape															
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Week -5		0.047 (0.042)	0.049 (0.042)	0.060 (0.040)	0.047 (0.041)	0.056 (0.041)	0.036 (0.045)	0.038 (0.041)	0.022 (0.042)	0.048 (0.041)	0.065* (0.036)	0.047 (0.041)	0.053 (0.042)	0.034 (0.040)	0.043 (0.042)	0.051 (0.041)	0.061 (0.040)
Week -4		-0.007 (0.068)	-0.007 (0.068)	0.022 (0.056)	-0.007 (0.066)	0.004 (0.066)	-0.051 (0.065)	-0.012 (0.068)	-0.044 (0.076)	-0.012 (0.067)	0.007 (0.064)	-0.012 (0.066)	-0.003 (0.069)	-0.030 (0.067)	-0.017 (0.069)	-0.013 (0.069)	-0.010 (0.071)
Week -3		-0.043 (0.063)	-0.043 (0.063)	-0.022 (0.064)	-0.032 (0.062)	-0.004 (0.057)	-0.035 (0.070)	-0.056 (0.059)	-0.060 (0.068)	-0.041 (0.062)	-0.014 (0.060)	-0.031 (0.062)	-0.013 (0.062)	-0.036 (0.063)	-0.032 (0.064)	-0.027 (0.064)	-0.007 (0.060)
Week -2		-0.053 (0.066)	-0.045 (0.067)	-0.006 (0.060)	-0.034 (0.066)	-0.015 (0.064)	-0.044 (0.074)	-0.040 (0.068)	-0.076 (0.066)	-0.034 (0.066)	-0.007 (0.059)	-0.033 (0.065)	-0.031 (0.069)	-0.044 (0.067)	-0.029 (0.067)	-0.019 (0.065)	-0.025 (0.069)
Week 0		-0.033 (0.065)	-0.033 (0.065)	0.008 (0.048)	-0.032 (0.063)	-0.006 (0.058)	-0.042 (0.071)	-0.039 (0.064)	-0.061 (0.070)	-0.032 (0.063)	-0.020 (0.062)	-0.036 (0.063)	-0.035 (0.067)	-0.052 (0.062)	-0.044 (0.064)	-0.029 (0.064)	-0.023 (0.066)
Week 1		0.007 (0.063)	0.012 (0.062)	0.036 (0.054)	0.007 (0.061)	0.011 (0.064)	-0.008 (0.068)	0.002 (0.063)	-0.028 (0.065)	0.007 (0.062)	0.021 (0.060)	0.007 (0.061)	0.028 (0.059)	-0.002 (0.063)	-0.019 (0.059)	0.002 (0.063)	0.023 (0.062)
Week 2		0.112** (0.040)	0.131*** (0.041)	0.142*** (0.038)	0.118** (0.040)	0.135*** (0.040)	0.118** (0.045)	0.125*** (0.041)	0.109** (0.047)	0.119** (0.041)	0.128*** (0.041)	0.127*** (0.040)	0.131*** (0.042)	0.111** (0.039)	0.141*** (0.038)	0.115** (0.041)	0.133*** (0.042)
Week 3		-0.069 (0.085)	-0.075 (0.085)	-0.022 (0.071)	-0.063 (0.083)	-0.043 (0.082)	-0.097 (0.088)	-0.074 (0.085)	-0.099 (0.095)	-0.073 (0.084)	-0.069 (0.085)	-0.067 (0.083)	-0.041 (0.083)	-0.088 (0.083)	-0.089 (0.083)	-0.055 (0.084)	-0.040 (0.082)
Week 4		-0.018 (0.075)	0.003 (0.078)	0.032 (0.074)	-0.001 (0.076)	0.033 (0.073)	0.021 (0.083)	-0.007 (0.077)	-0.042 (0.074)	0.008 (0.077)	0.032 (0.072)	0.012 (0.075)	0.013 (0.080)	-0.001 (0.078)	0.003 (0.079)	0.033 (0.072)	-0.000 (0.081)
Week 5		-0.034 (0.072)	-0.054 (0.070)	-0.012 (0.068)	-0.039 (0.070)	-0.012 (0.067)	-0.009 (0.071)	-0.045 (0.072)	-0.074 (0.074)	-0.039 (0.071)	-0.016 (0.068)	-0.052 (0.068)	-0.025 (0.073)	-0.059 (0.068)	-0.050 (0.071)	-0.045 (0.072)	-0.041 (0.075)
Baseline FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.39	0.41	0.39	0.40	0.35	0.40	0.40	0.35	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.39
Observations	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870

SOURCE: Attorney General's Office.

NOTES: Standard errors are clustered at the district level. Baseline FE refers to Fixed Effects at the district, week, and year. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.4: Multiple Hypothesis Testing

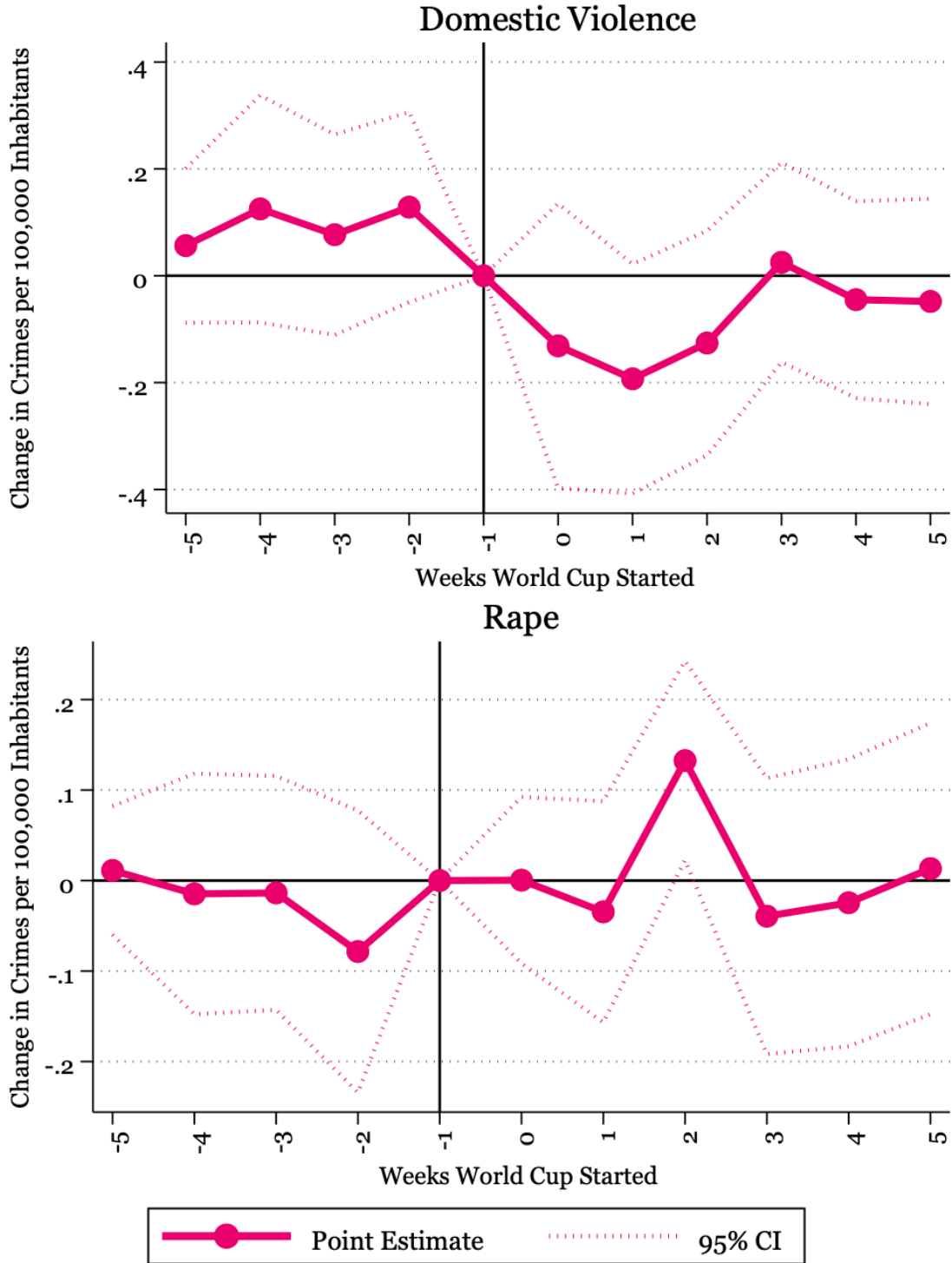
	(1) Domestic Violence	(2) Rape
Week -5	0.043 (0.514) [0.336]	0.014 (0.677) [0.390]
Week -4	0.054 (0.602) [0.368]	-0.003 (0.962) [0.520]
Week -3	-0.013 (0.894) [0.506]	-0.023 (0.659) [0.389]
Week -2	0.103 (0.212) [0.190]	-0.061 (0.325) [0.247]
Week 0	-0.135 (0.164) [0.160]	0.000 (0.994) [0.534]
Week 1	-0.081 (0.401) [0.279]	-0.028 (0.678) [0.390]
Week 2	-0.045 (0.645) [0.385]	0.122** (0.014) [0.038]
Week 3	0.090 (0.239) [0.201]	-0.053 (0.498) [0.336]
Week 4	-0.030 (0.689) [0.392]	-0.034 (0.565) [0.356]
Week 5	0.011 (0.903) [0.506]	-0.055 (0.292) [0.246]
Municipality FE	Yes	Yes
Week FE	Yes	Yes
Year FE	Yes	Yes
$R^2$	0.46	0.39
Observations	928	928

SOURCE: Attorney General's Office.

NOTES: P-values are presented in parenthesis and the sharpened q-values in brackets.



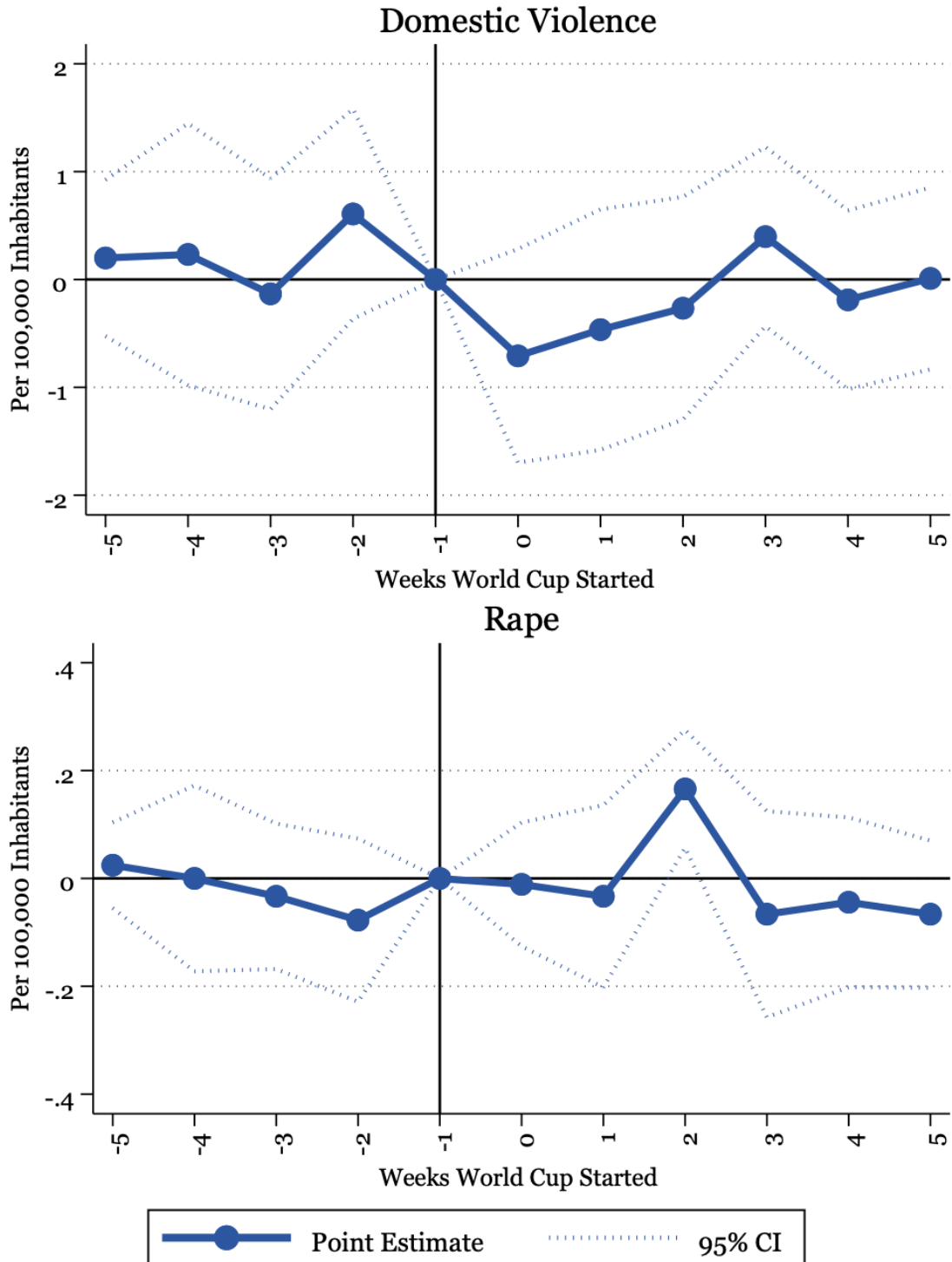
Figure A2: Without Population Weights



SOURCE: Attorney General's Office.

NOTES: The point estimations represent the coefficients calculated,  $\beta_q$ , using the event study specification. The confidence intervals around the point estimations are shown by the dashed lines. Standard errors are clustered at the district level.

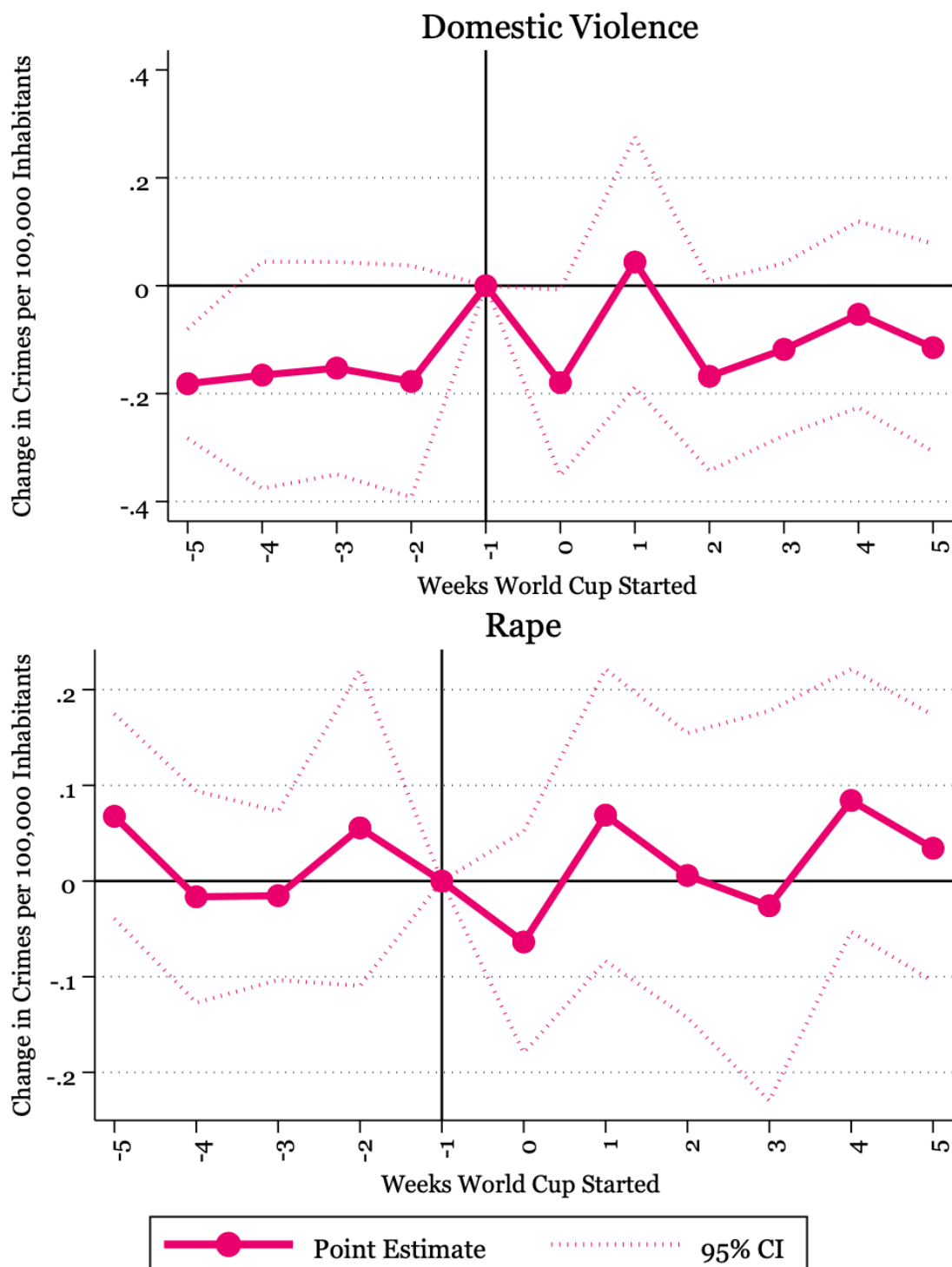
Figure A3: Robustness (4): Main Findings Using Rates



SOURCE: Attorney General's Office.

NOTES: The point estimations represent the coefficients calculated,  $\beta_q$ , using the event study specification. The confidence intervals around the point estimations are shown by the dashed lines. Standard errors are clustered at the district level.

Figure A4: Robustness (5): Placebo



SOURCE: Attorney General's Office.

NOTES: The point estimations represent the coefficients calculated,  $\beta_q$ , using the event study specification. The confidence intervals around the point estimations are shown by the dashed lines. Standard errors are clustered at the district level.