

A Statistical Evaluation of Femicide Rates in Mexican Cities along the US-Mexico Border

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Abstract: *During the last fifteen years, Mexican cities along the US-Mexico border caught the attention of the world due to their high homicide rates. In particular, the femicide problem, being an extreme case of gender violence, brought notoriety to the region, most acutely in the case of Cd. Juarez. The literature on the phenomenon, despite being vast, originated mostly from radical scholars, interest groups, international and nongovernmental organizations, and political activists, usually with little regard to the evaluation of statistical figures. This paper tries to close this literature gap by considering the statistical significance of the phenomenon. NAAIS data ranging from 1998 to 2003 is employed, leading to the striking result that femicide rates in the region, and in particular in Cd. Juarez, are consistent with the rates in non-border Mexican cities in the same states after factoring in the effects of male homicide rates. In absolute terms, femicide rates in Cd. Juarez are typically lower than in Houston and Ensenada, and as a share of overall homicide rates, they are typically lower than in most other cities considered in the study. The results indicate that high male homicide rates are in reality the most significant statistical feature of homicide rates in Mexican border cities.*

Keywords: Crime, Gender Violence, Violence against Women, Homicide, Femicide, Border, Mexico, Juarez

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One should never strike a woman; not even with a flower.

Hindu saying

1 Introduction

During the last fifteen years, Mexican cities along the US-Mexico border have caught the attention of the world due to high homicide rates. As shown in Albuquerque (2007), the high levels of violence originate from deficient law enforcement and legal systems, and from chaotic urbanization and high population densities.

Femicide, or the killing of women, seen by most as a particularly heinous category of violent crime, has received an even more significant amount of attention. It brought notoriety to the region, most acutely in the case of the infamous murders of Cd. Juarez.

The literature on the phenomenon however, despite being vast, originated mostly from radical scholars, interest groups, international and nongovernmental organizations, and political activists, usually with little regard to the evaluation of the available data. This paper tries to further the debate by statistically evaluating the phenomenon.

As in Albuquerque (2007), NAAIS data ranging from 1998 to 2003 is employed. The high quality data produced by coroners in Mexican cities allows for precise victim profiling. The femicide rates in Mexican border cities will be compared to the rates in the most populous non-border cities in the same states, and with femicide rates in Los Angeles and Houston. The results, as will be seen next, conflict with established perceptions in the field.

2 Violence against Women and Femicide

The United Nations defines violence against women as “any act of gender based violence that results in, or is likely to result in, physical, sexual

or psychological harm or suffering to women” (United Nations General Assembly, 1993).

Campbell et al. (2003) discuss femicide in the US and report that femicide is the leading cause of death among African-American women aged 15 to 45 and the seventh cause of death for women in general. Homicides perpetrated by intimate partners represent in between 40% and 50% of all femicides. Male homicides by intimate partners on the other hand are relatively less common, representing approximately 6% of overall male homicides. Homicides perpetrated by intimate partners are usually preceded by physical abuse. The authors conducted a multisite controlled experiment to identify risk factors for femicide in abusive relationships and found out that a partner unemployed and not looking for a job and partners that never lived together were the two most important predictors of fatalities.

Bott et al. (2005) consider the case of low and middle income countries, and find that gender-based violence is a complex phenomenon, affected by many factors that work at different levels. According to the authors, a characteristic of the research in the field of gender-based violence prevention is the methodological weaknesses of most studies, despite recent progress.

Glaeser & Sacerdote (1999) find that the main reason for higher crime rates in big cities, when compared to small cities and rural environments, and after controlling for many other variables, is the higher percentage of female-headed households, which are more prone to victimization than other types of households. Less efficient law enforcement and higher economic returns to crime have a less important impact but are also significant factors.

In the case of the Mexico-US border region, fast industrialization and increased trade following the NAFTA led to large scale migration of Mexicans towards cities along the border. Job opportunities abound in the region; yet, high population densities and chaotic urbanization resulting from fast growth have tended to exacerbate crime rates, with expected impacts on femicide rates. Albuquerque (2007) found that disparate outcomes regarding homicide

rates on the Mexican and American sides of the border originate not only from high population densities on the Mexican side but also from deficiencies in their law enforcement and justice systems, while cultural and economic factors do not seem to play a significant role.

3 Femicide Rates in Mexican Cities

Crime research in Mexico has always been difficult due to the limited availability of high-quality data. In the case of homicides, however, reliable data for Mexican cities can be gathered using the Núcleo de Acopio y Análisis de Información en Salud (NAAIS) database, which maintains detailed records on mortality causes produced by coroners (*médicos legistas*). Albuquerque (2007) describes the NAAIS data in detail, and shows that the homicide data is highly correlated with data gathered by press and nongovernmental organizations.

Table 1 is built using the NAAIS database. The table describes population numbers, homicide numbers by gender, homicide rates by gender, and the share of femicides relative to overall homicides for five selected Mexican border cities (Tijuana, Cd. Juarez, Reynosa, Matamoros and Nuevo Laredo), five selected Mexican non-border cities in the same Mexican states of the border cities (Cd. Chihuahua, Ensenada, Tampico, Cd. Victoria and Cd. Madero), two selected American cities (Los Angeles and Houston), and two selected American states (California and Texas).

[Table 1 appears approximately here]

The city selection criterion was population size and location in US or Mexican border states. Population numbers are for the year 2002, and were obtained from the Bureau of Justice Statistics (BJS) and the NAAIS.

Homicide numbers were accumulated from 1998 to 2003 and come from the FBI Uniform Crime Report (UCR) and the NAAIS.

Table 1 allows for comparisons of femicide numbers in Mexican border cities with numbers in non-border Mexican cities and American cities. The results are striking and go against established perceptions. As discussed in Albuquerque (2007), overall homicide rates in Mexican border cities are historically high. This is however due in large part to male homicide rates, as seen in Table 1. For example, the combined femicide rate of Mexican border cities is equal to the combined rate of Los Angeles and Houston, while the male homicide rate is 44% higher.

Even though femicide rates are 50% higher in the selected Mexican border cities than in the selected Mexican non-border cities, the male homicide rate is 100% higher. It could be argued that an environment conducive to crime, as the one found in the border cities, may lead to higher femicide rates. Additionally, the border cities are larger and denser than the same state non-border cities; therefore, femicide should be higher in Mexican cities along US-Mexico border than in other locations.

When the femicide share of homicides is considered, it becomes clear that femicide is not per se an exclusive problem of Mexican border cities. In reality according to Table 1, the most significant statistic feature of those cities is the high rate of male homicide. For example, in Cd. Juarez, a city notorious for its femicide rates, the femicide share of homicides is 13.1%, well below the femicide shares of Matamoros, Nuevo Laredo, Cd. Chihuahua, Ensenada, Tampico, Los Angeles and Houston. When seen as an isolated figure, femicide may appear to be a somewhat atypical phenomenon in Cd. Juarez, but when considered against the backdrop of violence in the city, the numbers appear to be consistent with other locations.

Two simple panel data regressions using the data in Table 1 may help to illustrate this point. Only the Mexican cities will be considered in this exercise, in order to minimize modeling complexity. Under the identification

hypothesis that femicide rates may be affected by male homicide rates, but that homicide rates are not affected by femicide rates, consider first the following model:

$$male_{it} = \beta_0 + \beta_1 pop_{it} + \beta_2 border_i + \beta_3 Juarez_i + \varepsilon_{it},$$

where $1 \leq i \leq 10$ represents the city cross-section index for the ten Mexican cities, $1998 \leq t \leq 2003$ represents the time index, *male* represents male homicide rates, *pop* represents population in millions, *border* is a dummy variable equal to one for the five Mexican border cities and zero for the other five non-border cities, and *Juarez* is a dummy variable equal to one for Cd. Juarez and zero for all other cities. The total number of observations in the panel is sixty. The model was estimated using pooled FGLS with cross-section weights and PCSE-corrected standard errors, leading to the following estimates:

$$\beta_0 = 3.46, \quad \beta_1 = 7.91, \quad \beta_2 = 6.45, \quad \beta_3 = -3.28,$$

$$\begin{matrix} (0.50) & (0.92) & (1.52) & (1.51) \end{matrix}$$

$$\bar{R}^2 = 0.62, \quad F - Statistic = 32.9,$$

where all estimated coefficients are statistically significant at the 5% level.

Notice from this regression that population size is economically and statistically significant and positively associated with male homicide rates, border location is also economically and statistically significant and positively associated with male homicides rates, and that Cd. Juarez has somewhat lower male homicide rates than the other ten cities, after controlling for the effects of border location and population size.

The second model uses the femicide rate as the dependent variable and adds the male homicide rate as one of the independent variables:

$$female_{it} = \alpha_0 + \alpha_1 pop_{it} + \alpha_2 border_i + \alpha_3 Juarez_i + \alpha_4 male_{it} + \mu_{it}.$$

This leads to the following estimates using the same methodology as in the previous regression:

$$\beta_0 = 0.74, \quad \beta_1 = -7.40, \quad \beta_2 = 0.05, \quad \beta_3 = 0.69, \quad \beta_4 = 0.11,$$

$$\begin{matrix} (0.15) & (4.89) & (0.20) & (0.43) & (0.02) \end{matrix}$$

$$\bar{R}^2 = 0.55, \quad F - Statistic = 17.1,$$

meaning that the only variable that explains femicide rates in the ten Mexican cities is male homicide rate. Location at the border and population size affect femicide rates only indirectly through male homicide rates. Furthermore, there is no statistically significant difference between femicide rates in Cd. Juarez and in any other city once control variables are factored in.

The two regressions should be taken only as a simple statistical exercise, since other socioeconomic and institutional factors could also affect both male homicide and femicide rates. Yet, they summarize well the features of the data presented in Table 1.

The main conclusions of this section therefore are: (1) cities with larger populations have higher male homicide rates and, as a result, have also higher femicide rates; (2) cities located along the border have larger male homicide rates, and, consequently, higher femicide rates; statistically, the male homicide rate is the most important explanatory factor of femicide rates; and (4) once these effects are factored in, femicide rates in Cd. Juarez are found to not be statistically different from femicide rates in all Mexican cities under consideration.

4 Cd. Juarez: A Critical Assessment of Existing Literature

One of the main characteristics of the existing literature on femicide in Mexican border cities is the use of preconceived notions and ad hoc statements not supported by empirical investigation. The following examples represent just a small part of the articles characterized by this type of methodological problem.

According to a report by the Organization of American States (Inter-American Commission on Human Rights, 2003), “authorities in Ciudad Juarez presented information with respect to the killing of 268 women and

girls since 1993. In a substantial number of cases, the victims were young women or girls, workers in the maquilas (assembly plants) or students... A significant number of the victims were young, between 15 and 25.”

This statement presents a victim profile that is not entirely consistent with the data. Figure 1 describes the occupation of femicide victims in Cd. Juarez. A large majority of victims is not employed or has unknown occupations. Only 10% of the victims work in manufacturing.

[Figure 1 appears approximately here]

Additionally, as can be seen in Figure 2, it is true that the number of victims with ages between 15 and 24 is significant, corresponding to 37% of the femicides. However, victims with ages above 24 represent however 47% of the femicides, a much larger share among victims. Reports on femicides in Cd. Juarez have an unfortunate tendency to focus their attention on women younger than 25, not doing justice to the larger share of women that were older than 25 when killed.

[Figure 2 appears approximately here]

Additionally, the common characterization of femicide victims as young and single maquiladora workers does not match the marital status profile of the victims, which is composed in its largest part by women that, at least once in their lives, lived with an intimate partner (married, cohabiting, divorced, separated or widow), as shown in Figure 3.

[Figure 3 appears approximately here]

Another example of an empirically unsupported statement is given by Wright (2001). The author states that “While the murder rate for women [in

Cd. Juarez] is far less than that for men, it is significantly higher than statistics reveal for female homicides per capita in any other major city in Mexico or in the United States.” This statement is not supported by the figures discussed in the previous section and shown in Table 1. The article also assumes, in an ad hoc fashion, that most victims work or are connected to the maquiladora industry, an essential hypothesis for the author’s main thesis, yet another empirically unsound assumption, as shown in Figure 1.

The stereotypical assumption that the femicide victims in Cd. Juarez are young maquiladora workers is commonly found in articles written by radical authors that follow Marxist or structuralist approaches. This empirically unsupported assumption unfortunately takes the focus of the debate out of the majority of victims that do not fit the stereotype, only contributing to the lack of understanding of the femicide problem in the border region.

5 Conclusions

Most of the conclusions in this article go against established perceptions regarding femicide in Mexican cities along the US-Mexico border. First, it was found that cities with larger populations have higher male homicide rates and, as a result, have also higher femicide rates. Additionally, cities located along the border have larger male homicide rates, and, consequently, higher femicide rates, but exclusively due to the larger male homicide rates. In other words, male homicide rate is the most important explanatory factor of femicide rates. Once these effects are factored in, femicide rates in Cd. Juarez are found to not be statistically different from femicide rates in all Mexican cities under consideration. The femicide rate in Cd. Juarez is also found to be typically lower than in Ensenada and Houston, and not very different from most Mexican border cities.

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Appendix

Table 1 – Femicide in Selected Regions

Region	Population 2002	Homicides 1998-2003		Homicide Yearly Rate per 100,000		Femicide Share of Homicides
		Male	Female	Male	Female	
Selected MX Border Cities	3,775,950	3,614	475	16.0	2.1	11.6%
Tijuana (BCN)	1,286,759	1,599	159	20.7	2.1	9.0%
Cd. Juarez (CHH)	1,268,556	1,170	176	15.4	2.3	13.1%
Reynosa (TAM)	446,550	258	51	9.6	1.9	16.5%
Matamoros (TAM)	443,879	240	46	9.0	1.7	16.1%
Nuevo Laredo (TAM)	330,206	347	43	17.5	2.2	11.0%
Selected MX Non-Border Cities	1,895,490	909	160	8.0	1.4	15.0%
Cd. Chihuahua (CHH)	705,653	364	62	8.6	1.5	14.6%
Ensenada (BCN)	396,183	316	56	13.3	2.4	15.1%
Tampico (TAM)	317,228	95	25	5.0	1.3	20.8%
Cd. Victoria (TAM)	280,543	75	9	4.5	0.5	10.7%
Cd. Madero (TAM)	195,883	59	8	5.0	0.7	11.9%
Selected US Cities	5,871,144	3,926	746	11.1	2.1	16.0%
Los Angeles (CA)	3,830,561	2,703	449	11.8	2.0	14.2%
Houston (TX)	2,040,583	1,223	297	10.0	2.4	19.5%
Selected US States	56,711,481	16,474	4,615	4.8	1.4	21.9%
California	34,988,261	10,632	2,618	5.1	1.2	19.8%
Texas	21,723,220	5,842	1,997	4.5	1.5	25.5%

Figure 1

Occupation of Femicide Victims in Cd. Juarez (1998-2003)

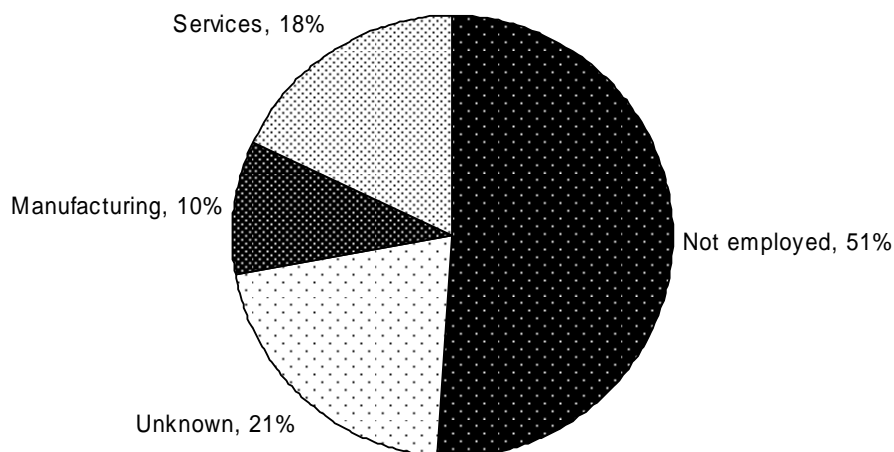


Figure 2

Age of Femicide Victims (Years) in Cd. Juarez (1998-2003)

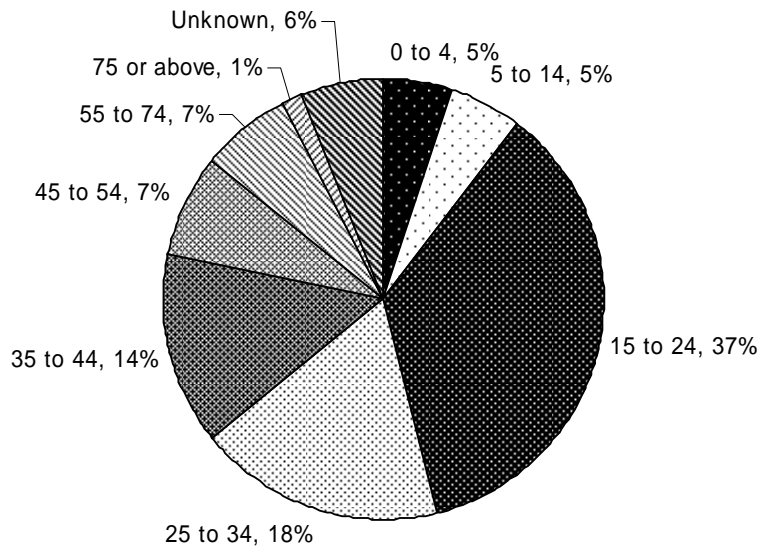


Figure 3

Marital State of Femicide Victims in Cd. Juarez (1998-2003)

