Rev Saúde Pública 2011;45(3)

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Femicides: female homicide in Brazil

ABSTRACT

OBJECTIVE: To assess female homicide rates due to aggression according to sociodemographic and health indicators.

METHODS: Ecological study on female homicides due to aggression in Brazil between 2003 and 2007. Information on 19,459 deaths were obtained form the Brazilian Mortality Database. Standardized female homicide rates due to aggression were correlated with 28 socioeconomic, demographic and health indicators, using Pearson's correlation test. Multiple linear regression was performed including variables with $p < 0.20$ and excluding those with multicollinearity.

RESULTS: The standardized female homicide rate due to aggression was 4.1/100,000 during the study period. After adjustment, three variables remained significantly associated with female homicides: birth rate ($p = 0.072$), percentage of Evangelicals ($p = 0.019$) and male homicides due to aggression ($p < 0.001$). The model had a predictive power of 69% ($r2 = 0.699$). The Brazilian states of Espírito Santo, Pernambuco, Mato Grosso, Rio de Janeiro, Rondônia, Alagoas, Mato Grosso do Sul, Roraima e Amapá showed the highest rates during the study period.

CONCLUSIONS: The female homicide rates due to aggression were high in Brazil and varied by region. The association with male homicides due to aggression stresses the importance of reducing structural violence to protect women against violence.

DESCRIPTORS: Women. Homicide. Cause of Death. Violence Against Women. Socioeconomic Factors. Ecological Studies.

INTRODUCTION

Violence against women known as gender-based violence is by the World Health Organization (WHO) a public health problem since 1990. Most violent acts occur at home and the victim usually knows the perpetrator. Gender-based violence includes property, sexual, psychological, and physical violence and may result in the woman's death by suicide or homicide.[13]

Homicides occurring due to gender-based violence are known as femicides, a political and legal term to refer to this type of death. The term femicide was first used by Russell[21] in a court of human rights[a] and refers to any manifestation of the unequal power relations between men and women that culminated with the death of one or more women because of their gender. This type of crime can occur in several situations including deaths perpetrated by an intimate partner with or without sexual violence, serial murders, sexual violence followed by death, and femicides associated with the death of another person.[7]

[a] Inter-American Institute of Human Rights. I Regional Report Situation and Analysis of Femicide in the Central American Region; 2006 Aug. San José, CR: IIHR; 2007.

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Received: 1/7/2010
Approved: 11/14/2010

Article available from: www.scielo.br/rsp

More than half of all female homicides are femicides caused by gender inequalities[6] and this phenomenon is present on several continents. It is estimated that between 60% and 70% of femicides in the United States and Canada are committed by current or former partners.[7] In Europe, in countries such as Russia, homicides and femicides increased with the collapse of the Soviet Union because of social disorganization, which led to the proliferation of gangs and violent crime.[11] Data from human rights organizations indicate that Guatemala, a country that has experienced violent internal conflicts, has one of the highest rates of femicides in the Americas. Between 2003 and 2005, 1,398 women were murdered in Guatemala, 1,320 in El Salvador, 613 in Honduras, more than 400 in Mexico and 269 in Nicaragua.

Male homicides due to violence have increased in several regions of Central America and South America and unlike female homicides both the victim and the perpetrator are men. Male murders are not caused by gender inequalities but rather by street violence: fighting, territory control, gangs, drug trafficking, death squads[19] while the majority of female homicides are caused by intimate violence that permeates the interpersonal relations between men and women.

Sociodemographic factors associated with female homicides by partners include poverty, age disparity between partners, and informal marital status. In many countries, one third of the women murdered were trying to separate from their partners, especially in the three months preceding the crime, and had a history of repeatedly experiencing violence and assaults.[9] Studies conducted in the United States found a relationship between femicide rates and areas with higher rates of poverty, instability, black population, unemployment and violent crimes.[6] Regarding the relationship between religion and violence, it is believed that the religious discourse reinforces misogyny, hegemonic masculinity and tolerance of violence against women as it preaches submission of wives to their husbands.[25] Femicides have been strongly associated with gender inequality and discrimination, economic deprivation, and aggressive masculinity and machismo including use of firearms, involvement with organized crime, drug and human trafficking, armed conflicts and high rates of male homicides due to physical violence.[12,19]

The socioeconomic conditions of the victims vary by country and circumstance. The pattern of femicides that is repeated in most countries suggest that women are at much higher risk than men of being killed by an intimate partner and this risk increases when there are disagreements between the couple.[6] In Latin America many murdered women are socially deprived and they are often depicted by the media as prostitutes, factory and transnational automaker workers known as *maquilas* in Spanish-speaking countries, and gang or drug trafficking members. In short, they are poor young migrants who live in slum areas or irregular housing projects, work in jobs with poor working conditions and are highly vulnerable.[19]

In Brazil, studies on femicides have showed higher rates among young white women with low schooling who are unskilled workers while the perpetrators are young married men, usually less educated than their victims, with a criminal record, repeated involvement in fighting, and engaging in threatening behaviors and violence against women.[3,4]

The objective of the present study was to assess female homicide rates according to sociodemographic and health indicators.

METHODS

Ecological study that correlated female homicides by geographical regions (states) with sociodemographic and health variables. The explanatory variables were obtained from secondary data from the *Pesquisa Nacional por Amostra de Domicílios* (Brazilian National Household Survey, PNAD) and the *Instituto Brasileiro de Geografia e Estatística* (Brazilian Institute of Geography and Statistics, IBGE) population census. Data were also obtained from the Brazilian Ministry of Health Database (DATASUS), the National Cancer Institute and the National Secretariat of Public Safety of the Ministry of Justice.

Our initial intention was to assess femicides but this information was not available from either death certificates or the Brazilian Mortality Database (SIM). Thus, we chose to use total female homicides as a "rough indicator" of femicides since 60% to 70% of these deaths are caused by gender inequalities.[6,7]

Similar studies were not found in the literature. Carcedo & Sagot[7] estimated the fraction of femicides among female homicides in Costa Rica and found 70% of femicides during 1990–1999. Another ecological study carried out in the United States[12] used as outcome information on femicides from related organizations and 36% of the federal units did not report the percentage of female homicides due to gender-based violence making it difficult to estimate femicide rates. The use of female homicides as a proxy of femicides in the Brazilian population may overestimate the actual rates but it may compensate for underreporting or ill-defined diagnosis of physical violence against women seen in some Brazilian macroregions since it is estimated 23% underreporting of deaths in the North region and 24% in the Northeast in 2009.[b]

[b] Brazilian Institute of Geography and Statistics. Estatísticas do Registro Civil 1999/2004/2009. [cited 2011 Mar 18] Available from: http://www.ibge.gov.br/home/presidencia/noticias/imprensa/ppts/0000000205.pdf [sent to the library for harmonization]

The dependent variable was female homicide rate estimated by state from 2003 to 2007. The rates were grouped into five years to reduce time and geographical fluctuations usually seen in events of small magnitude. Data from SIM were used and female homicides were categorized as X85 to Y09 codes according to the International Classification of Diseases – 10th Revision (ICD-10).

Population data for the denominators were obtained from the 2000 Population Census, the 2006 Population Count and intercensal projections by age group and gender provided by IBGE and available from the Brazilian Ministry of Health DATASUS website. Homicides rates were standardized using the WHO standard world population for 2000 to 2025. The standardization allows comparisons between areas with different demographic and age patterns as is the case of Brazilian macroregions.

The explanatory variables included 28 indicators, most of them disaggregated by sex. Those with no information by sex referred to household or total population and were analyzed globally. All indicators were disaggregated by geographical areas (states). The study variables were grouped into four major thematic blocks:

- Economic: Gini index (males and females); Human Development Index (HDI); percentage of economically active male and female population employed; average monthly income (males and females); percentage of poor in total population (less than 0.5 monthly minimum wage); percentage of white and black poor population; percentage of unemployment; percentage of female heads of household.
- Demographic: female marital status (married, separated, and single); percentage of illiteracy (males and females); percentage of people with 15 or more years of schooling (males and females); percentage of people not originally from the city (males and females); urbanization rate; percentage of black population (black and mixed), fertility rate; birth rate; and religion (percentage of Catholics, Evangelicals and no religion).
- Unionization, communication and public safety: percentage of unionized people (males and females); percentage of households with internet and cell phones; ratio of police to population.
- Health: female and male life expectancy; mortality rate from AIDS (males and females); standardized mortality rate from cervical and breast cancer; maternal mortality rate and proportional mortality from ill-defined causes (males and females) – an indicator of information quality; number of physicians per 1,000; and male homicide rates.

The data were gathered into a database using Microsoft Excel®. The dependent variable was plotted on the map of Brazil using Epimap.

Bivariate analysis was performed through Pearson correlation test using SPSS v. 10.0. Nine out of the 17 explanatory variables with $p<0.20$ were included in the multiple linear regression model. The best correlation values for indicators stratified by sex or other variable (poverty, religion, marital status) were included in the regression model. The variables with multicollinearity were excluded from the multivariate analysis. It was used a multiple linear regression model with backward selection method, in which, starting from a model including all variables, those with $p>0.10$ were progressively removed.

Although the study was based on secondary data available for public consultation, it was approved by the Research Ethics Committee at the Escola de Saúde Pública and State Health Department of Rio Grande do Sul (protocol CEPS-ESP 473/09).

RESULTS

Approximately 20,000 women were murdered in Brazil between 2003 and 2007, a standardized average homicide rate of 4.1 deaths per 100,000. Espírito Santo, Pernambuco, Mato Grosso, Rio de Janeiro, Rondônia, Alagoas, Mato Grosso do Sul, Roraima and Amapá were the Brazilian states with the highest female homicide rates during the study period (Figure 1).

Of 20,000 females killed during the five years studied, most were single young women with low schooling and 50.7% had black and mixed skin color. About 20% of these deaths occurred among children and adolescents under 20. Approximately one third of the deaths occurred in the victim's home (Table 1).

Table 2 shows the variables obtained from secondary sources grouped into four major blocks: economic; demographic; unionization, communication, public safety; and health.

Table 3 shows (Pearson's) correlations between standardized female homicide rates and the variables related to economic condition, demographics, unionization, communication, public safety and health. Significant correlations ($p<0.20$) were found between the percentage of poor population and HDI for the economic variables; marital status, religion, illiteracy and birth rate for the demographic variables; and households with cell phones and ratio of police to population; proportional mortality from ill-defined causes, female mortality rate from AIDS and male homicide rate for the health variables. The percentage of poor population (total, white and black) and HDI showed multicollinearity and thus were excluded from the multivariate analysis.

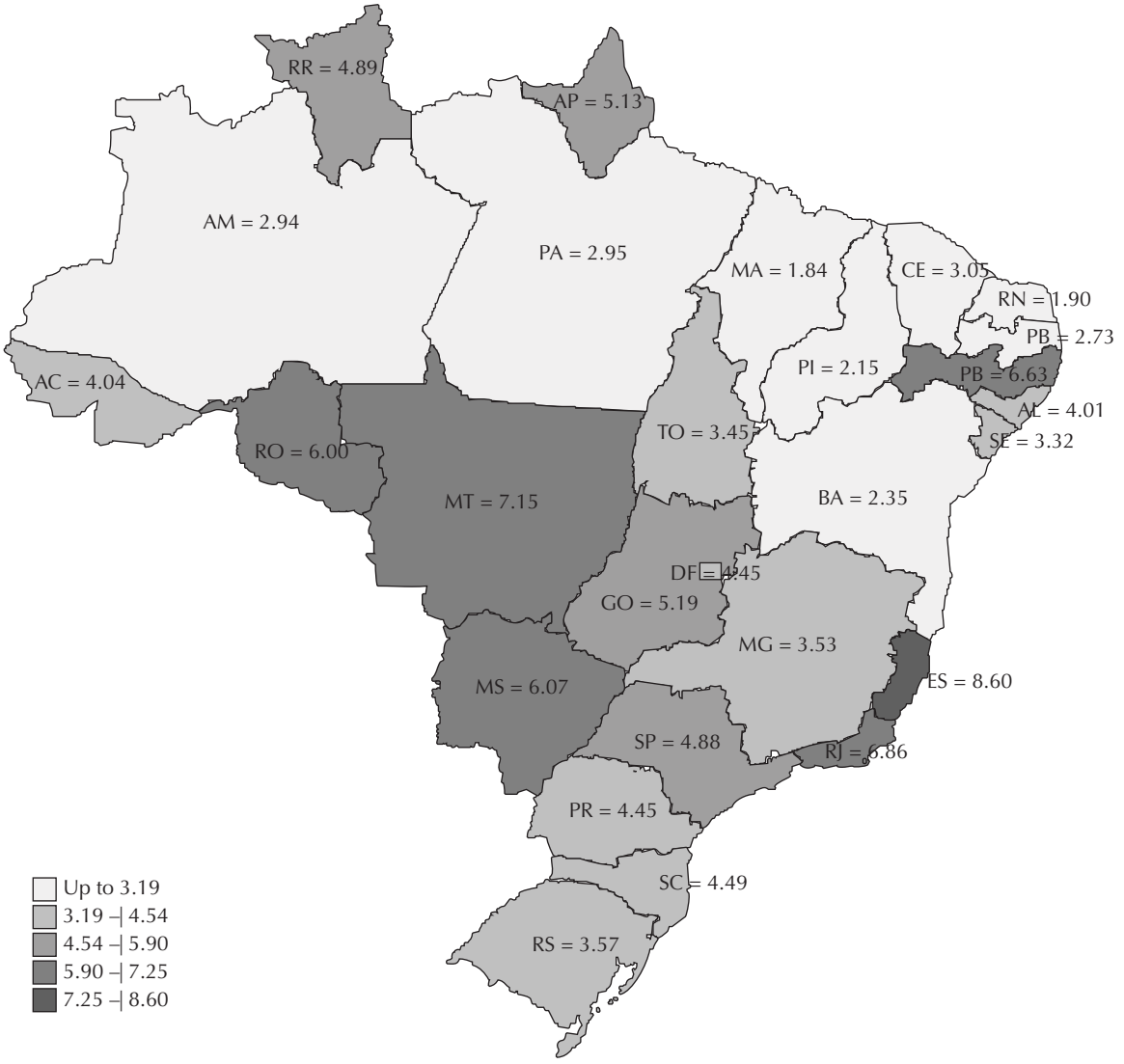

Figure 1. Standardized female homicide rates by federal states. Brazil, 2003–2007.

Table 4 shows the results of the multivariate analysis according to the nine variables included in the model. After adjustment, three variables remained significant: birth rate ($p = 0.072$); percentage of Evangelicals ($p = 0.019$); and male homicide rate ($p<0.000$). The model had a predictive power of 69% ($r^2 = 0.699$).

DISCUSSION

Homicides rates have been increasing in Brazil in recent decades, and it is one of the highest in the Americas.[23] Females homicides account for around 10% of all homicides, which may be suggestive of secondary relevance in view of few studies on this issue. However, despite its relatively lower rates, female homicides constitute a social problem and its magnitude is not comparable to that in the male population[7] because most female homicides are gender-based.[19]

The fact that one third of all deaths occurred in the victim's home supports the assumption notion they were femicides, i.e., deaths caused by an intimate partner, family member or acquaintance, contrasting with male homicides that largely occur in public spaces.

The distribution of the independent variables and the outcome was highly heterogeneous in Brazil allowing an ecological analysis. The highest female homicide rates were seen in the states of Espírito Santo and Rio de Janeiro in southeast Brazil, where it is also reported high male homicide rates, indicating high levels of urban violence. Pernambuco and Alagoas in the northeast region and some northern and central-west states, areas of migration and land conflicts, also showed high rates of female homicides. Rio de Janeiro, Pernambuco and Espírito Santo have reported higher rates of homicides nationwide and the capital city of Vitória, in the

Table 1. Female homicide rates. Brazil, 2003–2007.

Variables	Cases	%	Rate[a]
Age groups (years)			
1–10	601	3.1	0.7
10–20	3,337	17.2	3.5
20–30	5,950	30.6	7.2
30–40	4,162	21.4	5.9
40–50	2,649	13.6	4.9
50 and more	2,382	12.2	3.1
Unknown	288	1.9	
Schooling (years)			
None	966	5	2.3
1–3 years	2,645	13.6	6.8
4–7 years	4,773	24.5	5.1
8–11 years	2,573	13.2	-
12 and +	873	4.5	-
Unknown	7,539	39.2	
Ethnicity/skin color			
White	8,142	41.9	3.2
Black	9,865	50.7	4.7
Asian	37	0.2	1.5
Unknown	1,325	7.2	
Marital status			
Single	11,926	61.4	7.3
Married	3,256	16.7	1.5
Widowed	834	4.3	2.7
Separate	835	4.3	3.4
Unknown	2,518	13.3	
Place of occurrence			
Health care setting	5,475	28.2	
Home	5,484	28.2	
Road	5,468	28.1	
Unknown	2,942	15.5	

[a] Rates per 100,000 women

southeastern state of Espírito Santo, has the highest risk of death from homicide, followed by the cities of Recife, São Paulo and Rio de Janeiro.[14]

Economic indicators and indexes were included in the study to assess the association between female homicides and poor living conditions. A paradoxical inverse relationship was found contrasting with studies that found an association between poverty and femicides[9,12] or poverty and homicides.[2,15,22] Since the economic variables were strongly interrelated showing high colinearity and potential confounding effects they were not included in the multivariate analysis model.

It is noteworthy the change in traditional gender roles, and the massive entry of women into the formal work force allows many of them to achieve economic independence. This situation potentially creates conflicts as some men no longer have the role of breadwinners and heads of household and may have a strong reaction to this new status generating gender-based violence and even increasing the number of fatal cases.[8,20] This change in gender roles is reflected by the growing number of families where the woman is in the labor market and her partner is unemployed. Unemployed men may use violence against women to assert their authority,[19] and male unemployment has become a major risk factor for femicide.[6] The fact that this change has been seen mostly in large urban centers may explain the lower female homicide rates found in most northeastern states that have more conservative societies characterized by traditional gender roles and lower rates of female entry into the labor market than in other Brazilian macroregions.[c] However, it does not mean these areas are less violent but rather that violent deaths are either not reported or are included in other categories such as suicides or injuries. Pernambuco is the exception with high prevalence of urban gender-based violence as evidenced in Schraiber et al study.[24] These authors reported high prevalence of all types of violence among women in Pernambuco. Although it seems contradictory, in many situations and in more rigid traditional hierarchical societies, women may protect their lives by hiding the fact they are abused and not directly confronting domestic violence.[21]

It was initially hypothesized in this study that disadvantaged populations with lower education and higher birth and fertility rates would be more exposed to violence. However, in the final model, we found an inverse relationship between femicides and birth rates, i.e., the areas with lower birth rates had higher female homicide rates. This finding is consistent with the hypothesis that spousal violence that may eventually culminate in death is likely to be higher in societies where the traditional gender roles have changed. In other words, more educated women have more opportunities to enter the labor market and can exercise greater control over their reproductive life and consequently have less children.[10]

Homicide rates were expected to be higher in areas with greater migrant populations. Female migrants are more vulnerable and migrants in general life in poorer living.[6,17] In the present study, migration –measured by the percentage of males and females not originally from the city– was not associated with violence.

There was found a positive association between the outcome and the percentage of married women, and an inverse relationship with single women, which was

[c] IBGE. Mapa do mercado de trabalho no Brasil: 1992–1997. Rio de Janeiro :IBGE, 2001) [sent to the library for harmonization]

Table 2. Explanatory variables, sources of information, means, standard deviations, minimum and maximum values. Brazil, 2003–2007.

Variables	Source, year	Mean	SD	Minimum/maximum
Economic				
Gini Index (females)	PNAD, 2006	0.53	0.04	(0.45 - 0.62)
Gini Índex (males)	PNAD, 2006	0.52	0.04	(0.43 - 0.62)
Employed economically active women (%)	PNAD, 2006	23.9	2.5	(19.2 - 28.1)
Employed economically active men (%)	PNAD, 2006	33.4	2.1	(28.8 - 37.2)
Average monthly income (females)	PNAD, 2006	210.3	81.3	(106 - 485)
Average monthly income (males)	PNAD, 2006	438.4	162.9	(235 - 911)
Percentage of poor (less than 0.5 MMWs)	PNAD, 2006	39.8	16.2	(14.4 - 66.8)
Percentage of poor blacks	PNAD, 2006	45.8	14.4	(21.1 - 70.1)
Percentage of poor whites	PNAD, 2006	32.2	14.1	(11.1 - 57.9)
Unemployed (%)	Datasus, 2005-7	8.1	1.9	(4.5 - 11.5)
Female head of household (%)	PNAD, 2006	31.2	4.1	(23.2 - 41.8)
HDI	Atlas DH, 2000	0.73	0.1	(0.64 - 0.84)
Demographic				
Black population – black and mixed (%)	PNAD, 2006	29.3	9.1	(5.9 - 39.8)
Illiterate women (%)	PNAD, 2006	6.9	3.0	(2.9 - 13.3)
Illiterate men (%)	PNAD, 2006	7.8	3.9	(2.5 - 15.1)
Women with 15 years of study and more (%)	PNAD, 2006	2.9	1.3	(1.4 - 7.4)
Men with 15 years of study and more (%)	PNAD, 2006	2.1	1.2	(0.8 - 6.2)
Women not originally from the city (%)	PNAD, 2006	11.6	8.7	(2.3 - 33.7)
Men not originally from the city (%)	PNAD, 2006	11.2	8.7	(1.9 - 34.5)
Urbanization rate (%)	IBGE, 2007	81.2	8.2	(67.7 - 96.6)
Fertility rate	IBGE, 2006	2.2	0.4	(1.7 - 3.2)
Birth rate	IBGE, 2006	19.7	4.0	(14.0 - 29.8)
Married women (%)	IBGE, 2000	48.3	3.4	(43.8 - 55.8)
Single women (%)	IBGE, 2000	35.5	3.0	(29.5 - 40.1)
Separated women (%)	IBGE, 2000	4.9	0.8	(3.7 - 6.8)
Catholic religion (%)	IBGE, 2000	74.1	8.2	(55.6 - 89.8)
Evangelical religion (%)	IBGE, 2000	15.7	5.5	(6.1 - 27.1)
No religion (%)	IBGE, 2000	7.2	3.1	(1.9 - 15.7)
Unionization, communication, safety				
Unionized women (%)	PNAD, 2006	10.9	2.6	(5.2 - 16.2)
Unionized men (%)	PNAD, 2006	7.4	2.6	(2.4 - 14.1)
Households with internet (%)	PNAD, 2006	9.8	6.6	(2.1 - 28.6)
Households with cell phones (%)	PNAD, 2006	55.3	14.1	(29.1 - 87.2)
Police per population	SNSP/MJ, 2007	306	111	(91 - 609)
Health				
Life expectancy (females)	Datasus, 2007	75.3	2.5	(70.8 - 79.1)
Life expectancy (males)	Datasus, 2007	68.4	2.4	(62.8 - 72.1)
Female mortality from ill-defined causes (%)	Datasus, 2004-6	11.9	6.6	(1.6 - 23.2)
Male mortality from ill-defined causes (%)	Datasus, 2004-6	10.5	6.1	(1.4 - 21.4)
Mortality rate from cervical cancer	Inca, 2005-06	7.2	3.1	(3.8 - 15.5)
Mortality rate from breast cancer	Inca, 2005-06	10.4	4.2	(5.1 - 21.6)
Mortality rate from AIDS (females)	Datasus, 2004-6	3.1	2.0	(0.8 - 8.3)
Mortality rate from AIDS (males)	Datasus, 2004-6	6.2	3.7	(1.8 - 18.8)
Maternal mortality rate	Datasus, 2007	56.7	21.1	(29.1 - 125.2)
Physicians per 1,000 inhabitants	Datasus, 2007	1.4	0.7	(0.6 - 3.5)
Male homicide rate	Datasus, 2006-7	49.8	21.2	(19.1 - 101.1)

PNAD: Brazilian National Household Survey; HDI: Human Development Index; Atlas HD: Atlas of Human Development; IBGE: Brazilian Institute of Geography and Statistics; SNSP/MJ: National Secretariat of Public Safety of the Ministry of Justice; MS/DATASUS: Brazilian Ministry of Health Database; INCA: National Cancer Institute; MMWs: monthly minimum wages

Table 3. Correlation between female homicide rates and explanatory variables. Brazil, 2003–2007.

Variables	Females		Males		Total	
	R	p-value	R	p-value	R	p-value
Gini Index	-0.162	0.428	-0.175	0.373		
Employed economically active population	-0.490	0.803	-0.026	0.897		
Average monthly income	0.132	0.502	0.224	0.251		
Percentage of poor					-0.338	0.079
Percentage of poor whites					-0.340	0.077
Percentage of poor blacks					-0.339	0.078
Female head of household	-0.153	0.380				
Unemployed					0.163	0.407
HDI					0.287	0.131
Black population (black and mixed)					-0.162	0.411
Illiteracy rates	-0.177	0.368	-0.259	0.184		
15 years or more of schooling	0.164	0.405	0.155	0.431		
Not originally from the city	0.108	0.583	0.123	0.533		
Urbanization rate					0.231	0.237
Fertility rate	0.212	0.300				
Birth rate	-0.252	0.197				
Living with a partner, married women	0.250	0.200				
Single women	-0.387	0.042				
Separated women	0.209	0.287				
Catholic religion					-0.511	0.005
Evangelical religion					0.471	0.001
No religion					0.437	0.020
Unionized (%)	0.114	0.563	-0.177	0.368		
Households with internet (%)					0.162	0.409
Households with cell phones (%)					0.335	0.082
Police per population					-0.256	0.188
Life expectancy	0.212	0.279	0.169	0.389		
Mortality rate from ill-defined causes (%)	-0.357	0.063	-0.389	0.041		
Mortality rate from cervical cancer (standardized)	-0.166	0.399				
Mortality rate from breast cancer (standardized)	0.174	0.376				
Mortality rate from AIDS	0.298	0.012	0.242	0.216		
Maternal mortality rate (per 100,000 live births)	-0.216	0.270				
Physicians per 1,000 inhabitants					0.237	0.225
Male homicide rate			0.757	0.000		

HDI: Human Development Index

not lost in the final model. In the United States married women were less likely to be murdered than single ones[6] and in Canada women living with a partner were eight times more likely to be murdered than married women. Knowing the marital status of a woman can be a protective factor as women trying to separate from their husbands, partners or boyfriends are at higher risk of femicide.[9]

Religion in general supports the ideal model of a patriarchal family where women are under the authority of their husbands, which may encourage violent male behaviors. Pentecostals view women in a servant, subordinate position with little access to decision making, which makes violence seems natural and makes it difficult to offer resistance and report it.[25]

The Brazilian religion map was included in the study and the percentage of Evangelicals remained in the final model, suggesting an association between high frequency of Evangelicals and femicides. In Brazil, the largest contingent of evangelical believers are in the northern and central-western states while the Northeast has the lowest number of Pentecostal churches with a high rate of Catholics.[1] The growing number of Evangelicals in Brazil can be explained by economic

Tabela 4. Multivariate linear regression model, input variables and final model.[a] Brazil, 2003–2007.

Variables	Standardized beta	B (95% CI)	p-value
Input model			
Illiterate males	- 0.057	-0.023 (-0.265;0.219)	0.843
Female mortality rate from AIDS	- 0.052	-0.041 (-0.383;0.302)	0.807
Male mortality rate from ill–defined causes	- 0.123	-0.032 (-0.149;0.086)	0.579
Single women	0.150	-0.078 (-0.295;0.139)	0.460
Police per population	- 0.150	0.002 (-0.008;0.004)	0.456
Households with cell phones	- 0.235	-0.026 (-0.093;0.040)	0.417
Evangelical religion	0.182	0.052 (-0.071;0.185)	0.386
Birth rate	- 0.289	-0.108 (-0.285;0.068)	0.214
Male homicide rate	0.668	0.049 (0.029;0.071)	0.000
Final model			
Birth rate	- 0.211	-0.079 (-0.166;0.008)	0.072
Evangelical religion	0.293	0.084 (0.015;0.153)	0.019
Male homicide rate	0.827	0.050 (0.045;0.078)	0.000

[a] Dependent variable: female homicide rate
95%CI: 95% confidence interval

inequality with a strong presence of Pentecostal churches in socially deprived areas. Pentecostals have members among lower income populations and reached areas inaccessible to other religions and characterized by precarious conditions with a complete lack of public power.[5] The overlap between the map of Evangelicals and femicides questions not only the association with poverty but also shows that femicides as well as Pentecostals are more prevailing among "the poorest of the poor" or areas of extreme social deprivation and lack of public power. It is thus verified that femicide is the last violation and act of power against women or the most extreme form of sexual terrorism.[12]

The variable that showed the strongest association and the highest level of significance in the final model was male homicide rate. While male homicide is an indicator of urban violence, female homicide is an indicator of interpersonal violence. Contrasting with other studies,[7,12] these two forms of violence were strongly associated in the present study. Homicide rate is an indicator of urban and social violence associated with social and economic inequalities, weak role of the State regarding public policies and ineffective public safety actions – all factors contributing to impunity, organization of death squads and drug trafficking.[18]

The association between indicators of urban violence and gender-based violence suggests that high-stress societies play an important role in violence against women. High-stress societies are those that go through a transformation process that may be called modernization, with civil unrest, armed conflicts, war or terrorism causing harmful effects on the weakest.[16] This explains the strong association between male and female homicides in Brazil predominantly in more violent areas. These areas include urban spaces disputed by drug traffickers and border regions where there are land disputes, land grabbing, intense migration, prostitution and sexual exploitation. Studies with border populations and those living in areas of armed conflicts in Mexico and Central America have showed that these areas have the highest rates of femicides. The border is a place of crossing and migrant inflow where family relationships are strained, structures break down and relations marked by inequalities become more unequal and all of these are directed against women without a face bringing terror[17] within an environment of impunity, disintegration of the state and failure of law enforcement.

A study limitation is the use of secondary data. There may have been information of varying quality, death underreporting, inadequate reporting of diagnoses and inadequate completion of death certificates with homicides reported as suicides or injuries. This practice is not widespread but it is mainly seen in northern and northeastern Brazil.[c] Another limitation of the study refers to its design that may result in ecological fallacy such as the association between lower birth rates in better-off population and femicide, which mostly occurs among poor women. However, despite these limitations, the study results evidenced significant associations especially between structural violence and gender-based violence showing the importance of fighting violence with global interventions.

The present study shows the often underestimated magnitude of female homicides in Brazil. Further studies on femicides are needed, especially in the Brazilian states with growing homicide trends. We

stress the importance of using the gender factor while analyzing female homicides. The use of the gender category in the analysis of vital events calls for a new political stand of viewing violent deaths as an unnatural act, not only attributing them to factors of a personal nature and understanding gender hierarchy in the Brazilian society as a factor that expose women to all sorts of vulnerabilities with resultant femicide.

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Research funded by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq – Process nº: 472238/2007-8).
Study presented at the meeting "Fazendo Gênero 9", held in Florianópolis, 2010.
The authors declare no conflicts of interests.