

Increase of fear of crime in rural Brazil and police legitimacy

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ABSTRACT

In this article, we assess individuals' fear of crime in Brazil with a focus on rural areas using ordered probit models and data from six waves of the Latino barometer survey conducted between 2008 and 2018 (N = 10,153). Results show that there has been a marked decrease in respondents' perceived safety after 2012, with those living in rural areas experiencing a more significant increase in fear of crime than those in urban areas. While violence in an area does not negatively affect individuals' fear of crime levels, lack of trust in the police and an individual's previous experience of victimisation do. The association between trust in the police and people's perceived safety, particularly accentuated in rural settings compared to urban environments, indicates the importance of institutions in providing public reassurance.

1. Introduction

Understanding the interplay between fear of crime and the nature of policing in rural areas is important for developing strategies to make rural areas safe (Mawby and Yawood, 2016; Rodgers and Asquith, 2022). Safety is a human right; it ensures people's freedom to carry out their routine activities without fear. Although rural areas are typically considered peaceful and safe, they are heterogeneous environments that are in constant transformation (Donnermeyer, 2016).

Research on fear of crime in rural areas is relatively scarce (but see Baloch, 2013; Wladyka and Yaworsky, 2017; Patel, 2020), and is predominantly derived from areas of the Global North (Abraham and Ceccato, 2022). In this study, we aim to contribute to fill the gap by reporting results from Brazil and using six waves of representative data from the Latino Barometer Survey (N = 10,153) from 2008 to 2018 to investigate the conditional probability of individual and area-level characteristics on declared levels of fear of crime in Brazilian rural areas, using the urban areas as a reference. By doing this, the study seeks to fill a gap in the existing literature by examining potential variations in safety perceptions temporally in rural environments of Brazil, a Global South country with high levels of fear and unequal victimisation that negatively impact people's lives (Institute for Economics & Peace - IEP, 2021).

An important reason for having Brazilian rural areas as a study area is the lack of trust and legitimacy in the police. Issues such as poor service quality, police violence, and corruption are major contributing

factors to this distrust (Costa and Durante, 2019; Rolim and Hermann, 2018; Silva and Beato, 2013; Silva, 2012). This trust should be built through consistent, fair, and transparent behaviour by authorities over time (Tyler and Huo, 2002).

Another important reason is that there is also a rising incidence of lethal violence, particularly in the North and Northeast regions of the country (Brazilian Forum on Public Safety - BFPS, 2020), which are the least urbanized regions of the country (Brazilian Institute of Geography and Statistics – IBGE, 2015). Thus, it remains unclear how experiences of victimisation and declared mistrust of the police affect people's safety perceptions in rural regions of the country. This is particularly relevant in the context of Brazil, where land reform conflicts, mining, deforestation, and hate crimes characterize the historical socio-economic exclusion of specific groups in rural areas, such as indigenous populations and the rural poor (Pastoral Land Commission, 2019; Ceccato and Ceccato, 2017; Institute of Applied Economic Research - IPEA, 2020). The remoteness faced by rural residents in a country of continental dimensions makes it difficult for them to access basic services, including police and other criminal justice resources (De Heredia and Cintrão, 2012; Roldão, 2018).

This empirical study aims to answer the following research questions.

- i) What percentage of respondents feel (un)safe in rural areas?
- ii) Do declared safety perceptions vary by individual characteristics and over time?

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- iii) How do individuals' previous experiences of victimisation impact their perceptions of safety? To what extent does area-level lethal violence influence fear of victimisation? Are there differences between rural and urban areas?
- iv) Does trust in the police impact individuals' safety perceptions? Are individuals' safety perceptions more affected by trust in the police in rural than in urban areas?

The word 'crime' indicates (levels of) victimisation, while 'fear of crime' is used here as a general term that indicates poor safety perceptions or poor perceived safety. These terms are often linked to the risk of being a victim of a crime but may also include feelings of overall anxiety. Thus, the terms "fear of crime," "fear of victimisation," "poor safety perceptions," and "poor perceived safety" are considered synonyms in this article and are used interchangeably.

We follow the recent strand of Western research on rural criminology and hypothesize that both social, individual, and place-related factors can contribute to explaining patterns of safety perceptions. Hence, this study seeks to address several key research questions: First, it examines the proportion of respondents who feel safe or unsafe in rural areas, exploring whether these safety perceptions vary based on individual characteristics and over time. Second, it investigates how past experiences of victimisation influence safety perceptions and assesses the extent to which area-level lethal violence impacts fear of victimisation, comparing these effects between rural and urban settings. Lastly, the study explores the role of trust in the police as an indication of police legitimacy in shaping individuals' safety perceptions, specifically examining whether trust in the police has a greater impact on safety perceptions in rural areas compared to urban areas. Drawing on previous evidence, we hypothesize that police trust is a fundamental part of rural communities, contributing to 'public reassurance' – that is, that the level of access to police services affects trust in the police (Wakefield and Fleming, 2009) – and therefore directly affects the declared levels of fear of crime in rural areas.

The structure of this paper is as follows: Section 2 provides a theoretical framework that elucidates the individual and contextual factors connected to feelings of safety. Section 3 provides details of our case study, empirical modeling of safety perceptions, and the data sources used. We present and discuss our findings in Sections 4 and 5, respectively. Finally, our concluding remarks are provided in Section 6.

2. Factors affecting fear of crime in rural and urban contexts

Fear, according to Warr (2000, p. 453), is "an emotion, a feeling of alarm or dread caused by awareness of expectation of danger" while "fear of crime" is defined by Hale (1996) as the fear of being a victim of a crime as opposed to the actual probability of being a victim of crime. Garofalo (1981, p. 72) defines it as a "sense of danger and anxiety produced by the threat of physical harm". This phenomenon is influenced by multiple characteristics, involving individual, socioeconomic, and public safety factors.

While high rates of crime are often associated with high overall levels of fear in urban areas (Donnermeyer and Kreps, 1986; Harris and Harkness, 2016; Skogan, 1990), the relationship between crime and individuals' declared fear seems to be far more complex in rural areas (Ceccato, 2022). On one hand, geographical isolation can reduce accessibility for potential offenders in rural areas, potentially enhancing feelings of safety. On the other hand, the open, sparse, and less densely populated nature of rural areas can lead to increased worry and anxiety (Panelli et al., 2005). These mixed emotions about rural environments are encapsulated by the term 'topophobia,' which refers to experiences of fear, anxiety, and depression in certain spaces and landscapes (Relph, 1976, p. 27).

Rural areas, where crime rates are normally lower than in urban areas, are often seen as free from crime and fear of crime (Ceccato, 2016). Geographical isolation may also lead to fear because of the

feelings of being forgotten, of distrust in society and public authorities (Cox, 2017; Edwards et al., 2001; Jansson, 2013), leading to a sense of powerlessness. In rural contexts, poor communication, long police responses, and low conviction rates can all contribute to individuals feeling like second-class citizens, affecting police legitimacy (Donnermeyer and Barclay, 2005). The legitimacy of the police is rooted in public belief that they possess rightful authority, leading citizens to feel morally obligated and duty-bound to respect, accept, and comply with their authority (Tyler and Huo 2002).

Thus, the legitimacy of the police in rural areas plays a significant role in shaping fear and perceptions of safety. Effective policing can mitigate fear by fostering trust and a sense of security within the community. Research shows that residents of rural areas often show more positive attitudes towards the police than those in urban and suburban settings (Meško and Hacin, 2024). Conversely, a lack of police presence or perceived inefficacy can exacerbate feelings of vulnerability and fear among rural residents. International research has shown that fair and respectful treatment by the police and courts leads to greater public compliance and support for the legal system (LaFree, 2018; Tyler, 2006; Tyler and Huo, 2002). Individuals' trust in public institutions and authorities, such as the police, are found to be associated with declared levels of fear. It comes as no surprise that lower levels of police satisfaction are often linked to higher levels of fear (Lytle and Randa, 2015). The police and recognised police efforts have also been found to play a role in fear of crime, as seen in studies by Ho and McKean (2004) and Abbott et al. (2020). This may be due to poor access to police services, given the fact that police stations are being shut down, or the perception that reporting a crime is a futile effort, as the police or criminal justice actors may not take crime reports seriously (Morris et al., 2020).

Despite conflicting findings (Cates et al., 2003; Garofalo and Laub, 1978), international research shows that previous perceptions of victimisation (e.g. the experience of being assaulted, subjected to intimidation, or mugged) remains an important determinant of an individual's declared safety (Hale, 1996; Hirtenlehner and Farrall, 2014; Otis, 2007; Yates and Ceccato, 2020). The relationship between previous victimisation and safety perceptions is influenced by other individual factors, such as age and gender. While younger individuals are statistically more likely to be victimized, older and/or disabled individuals tend to report higher levels of fear (Furstenberg, 1971; LaGrange and Ferraro, 1989). This discrepancy between previous victimisation and safety perceptions at the individual level does not fully capture the complexity of the underlying contextual factors. Socially constructed anxieties (Beck, 2006) have been associated with major changes in society (Giddens, 1990), but also factors such as health and financial conditions as well as the ethnicity of a group, sexual and religious-based stigmatisation (Valente and Pertegas, 2018).

Research also suggests that certain groups, including women, older adults, ethnic minorities, and those who are economically disadvantaged (including those with lower levels of education), experience fear or poorer safety perceptions than the general population (Box et al., 1988; Garofalo and Laub, 1978; Jordan and Gabbidon, 2010; Kanan and Pruitt, 2002; LaGrange et al., 1992; Mellgren et al., 2018; Smith and Pain, 2008). Some of these observable characteristics may reflect an individual's perception of their ability to defend themselves in potentially dangerous situations (Allik and Kearns, 2017). Stressful life events such as previous victimisation experienced by the individual are a significant factor in determining fear of crime and overall anxiety, although findings are inconsistent (Hirtenlehner and Farrall, 2014; Otis, 2007), as individuals differ in their likelihood and vulnerability.

Either in large urban centres or in rural areas, infrequent but severe crimes, such as homicides, can significantly impact residents' safety perceptions. These "rare events" may disproportionately contribute to heightened fear and overall anxieties in a community. The gunshots in favelas have an impact on city residents far from the location of the incidents (Zaluar, 2012), even challenging the high walls of gated communities that have become increasingly prevalent due to the

counter-urbanisation of the wealthy in the outskirts of the large urban centres (Low, 2001; Landman and Schönteich, 2002). Perceptions of disorder have also been linked to implicit biases about race and deprivation (Wilson and Kelling, 1982; Sampson and Raudenbush, 2004), which can perpetuate segregation and fear. Furthermore, previous research has shown evidence of how regional and neighbourhood factors can contribute to poor safety perceptions (Nalla et al., 2011; Davanzo et al., 2021; Scarborough et al., 2010). Below, we discuss the methodological steps taken to execute the empirical analysis of the study.

3. Methods

3.1. The case study

The Brazilian territory, with an area of over 8.5 million square kilometres, is classified as urban or rural based on the political-administrative concept used by the Brazilian Institute of Geography and Statistics (Brazilian Institute of Geography and Statistics, 2023). The urbanisation rate varies significantly by region in Brazil, with the Southeast at 93% and the North and Northeast at around 73% (IBGE, 2015).

Brazil's violence varies by location, with the North and Northeast seeing more violent deaths, while the South, Southeast, and Centre-west have lower rates (BFPS, 2021). Rural areas have seen a greater increase in homicide rates than urban regions (BFPS, 2020), and rural areas also experience a higher growth rate of physical assault and attempted theft/burglary than urban areas (Scorzafave et al., 2015). Brazil's high homicide rates have multifaceted and complex causes such as low levels of human capital, weak institutions, economic performance, urban and rural social conflicts, and organised crime (Ceccato et al., 2007; Justus et al., 2018; Pereira and Queiroz, 2016; Resende and Andrade, 2011; Scorzafave et al., 2015).

3.2. Data and selected variables

This study relies on two sources of data. The first one is provided by the Latin American Public Opinion Project (LAPOP), conducted by researchers at Vanderbilt University in the USA. The sampling methodology of LAPOP surveys (The AmericasBarometer by the LAPOP Lab, n. d.) involves stratification based on size, urban/rural location, and region to select a representative sample of eligible voters aged 16 or older. The second source of data was used to include the homicide rate as a control variable in our empirical model, and it was obtained from data compiled by the Brazilian Ministry of Health's Mortality Information System for each of the 27 federal units in Brazil throughout the years analysed (Brazil, 2023).

This study utilised six waves of AmericasBarometer research conducted in Brazil, which included bi-annual samples from 2008 to 2018. These data were organised into sets of pooled data, and the final sample comprised 10,153 observations, with 1490 individuals from rural areas and 8663 from urban regions of Brazil. The variable we used as our dependent variable was obtained from responses to the following question in the survey:

"Speaking of the neighbourhood where you live and thinking of the possibility of being assaulted or robbed, how do you feel?"

The survey responses were categorised with a score of 1 indicating "Very safe", 2 indicating "Somewhat safe", 3 indicating "Somewhat unsafe", and 4 indicating "Very unsafe".

The selected explanatory variables for investigating the individual and spatiotemporal aspects of safety perceptions in Brazil are presented in Appendix A.1. The selection of these variables was based on individual and regional characteristics that could influence declared safety perceptions, as well as previous research and theories aimed at clarifying the determinants of safety.

White is a binary variable that indicates whether the individual is white or not. In this case, the variable is coded as 1 if the individual is white and 0 otherwise. This variable was added to understand whether race plays a role in safety perceptions, as research has shown that individuals from different racial and ethnic backgrounds may have different experiences of safety (Jordan and Gabbidon, 2010; Kanan and Pruitt, 2002; LaGrange et al., 1992).

The binary variable "Employed" indicates whether an individual is currently employed or not. This variable can be useful in investigating whether employment status is associated with one's perceptions of safety, as those who are unemployed or have unstable employment may feel more susceptible to criminal activity. Conversely, those who are employed may encounter public spaces more frequently, such as on public transportation or walking along streets, which could also impact their sense of safety (Ceccato, 2014; Delbosc and Currie, 2012).

Man is a binary variable coded as 1 if the individual is a man and 0 otherwise. This variable was included to understand whether gender plays a role in safety perceptions, as research has shown that men and women may have different perceptions and experiences of safety (Callanan and Teasdale, 2009; Franklin and Franklin, 2009; Schafer et al., 2006; Stanko, 1993).

Age is a continuous variable that indicates the age of the individual in years. This variable can help us to understand whether there is a relationship between age and safety perceptions, as research has shown that younger and older individuals may have different experiences of safety (Brennan, 2011; Greve, 1998; LaGrange and Ferraro, 1987; Tulloch, 2000). Additionally, age can also be related to other factors that may influence safety perceptions, such as employment status, income, and social support networks.

The variable "schooling level" is a categorical variable that measures an individual's level of education, with "no schooling" serving as the benchmark category. This variable determines the relationship between education and safety perceptions. It is widely acknowledged that education can affect an individual's level of awareness and understanding of safety risks, as well as their ability to make informed decisions about their safety (Carcach et al., 1995; Scarborough et al., 2010; Smith and Hill, 1991). Thus, individuals with higher levels of education may be more likely to feel safe and confident in their surroundings, while those with lower levels of education may feel more vulnerable and at risk.

"Victim" is a binary variable that indicates whether the individual has been a victim of any type of crime in the past 12 months. This variable provides insights into how personal experience with crime affects an individual's declared safety perceptions. Individuals who have been victims of crime may perceive their environment as more dangerous and feel less secure, leading to higher levels of fear of crime (Abbott and McGrath, 2017; Nalla et al., 2011; Rader, 2004; Smith and Hill, 1991).

We use "Trust in the police" as an indicator of police legitimacy. The variable "Trust in the police" measures the extent to which individuals trust the Military Police, ranging from 1 (not at all) to 7 (a lot). If individuals have high levels of trust in the police, they may feel safer in their environment, knowing that law enforcement agencies are working to prevent crime and protect citizens. Conversely, low levels of trust in the police can lead to a reduced sense of safety (Donnermeyer and Barclay, 2005; Lytle and Randa, 2015; Nofziger and Williams, 2005).

The variable "Homicide rate" indicates the number of homicides per 100,000 inhabitants for the 27 Federation Units in Brazil. High homicide rates can lead to a general perception of unsafety and fear of crime among individuals, affecting their daily lives and behaviour (Mason et al., 2013).

The variables North, Northeast, Central-west, Southeast, and South are binary variables that represent the five macroregions of Brazil, with the North region as the benchmark category. These variables are important to understand regional differences in safety perceptions, as different regions may have distinct social and economic contexts that can influence the sense of safety. Finally, year dummies from 2008 to 2018 were included to understand how safety perceptions have changed

over time, as societal changes and public policies may have impacted safety perceptions in different ways.

3.3. Empirical strategy

The dependent variable in this study ($safety_i$) is multinomial categorical, with responses following an ordinal classification (i.e., very safe, somewhat safe, somewhat unsafe, and very unsafe). Within the context of generalized linear models (GLMs) (Nelder and Wedderburn, 1972), ordered probit models are necessary for this case since the dependent variable does not follow a normal distribution. Based on Cameron and Trivedi (2005) and Greene (2012), the ordered probit model can be represented by Eq. (1):

$$safety_i^* = x_i'\beta + \varepsilon_i \quad (1)$$

where x_i is a vector of characteristics to explain safety in urban and rural areas (Appendix A.1) and ε_i is normally distributed $\varepsilon_i \sim N(0, 1)$. Our dependent variable $safety_i$ corresponds to an individual's response regarding the feeling of being assaulted or robbed in their neighbourhood, which can take on one of four integer values (1, 2, 3, and 4). The unobserved latent variable, $safety_i^*$, represents an individual's propensity to agree with the statement provided. For very low values of $safety_i^*$, the feeling of safety is "Very safe"; as $safety_i^* > \alpha_1$ the feeling of safety improves to "Somewhat safe"; as it increases further above $safety_i^* > \alpha_2$, it becomes "Somewhat unsafe", and finally, as it increases above $safety_i^* > \alpha_3$, it becomes "Very unsafe". The relation between the latent and observed variable is expressed in Eq. (2):

$$safety_i = 1 \text{ if } -\infty < safety_i^* < \alpha_1$$

$$safety_i = 2 \text{ if } \alpha_1 < safety_i^* < \alpha_2 \quad (2)$$

$$safety_i = 3 \text{ if } \alpha_2 < safety_i^* < \alpha_3$$

$$safety_i = 4 \text{ if } \alpha_3 < safety_i^* < \infty$$

where α 's are unknown parameters defined as cut points to be estimated with β .

The probability that the i th interviewed response is $j = 1, 2, 3, 4$ follows Eq. (3):

$$\Pr[y_i = j] = F(\alpha_j - x_i'\beta) - F(\alpha_{j-1} - x_i'\beta) \quad (3)$$

where F is the cumulative density function (cdf) of ε_i . The regression parameters β and the cut points α 's are obtained by maximising the log-likelihood of both sets of parameters. For the ordered probit model, $F(\cdot)$ is the standard normal cdf.

Once the probability associated with each of the j responses is estimated, marginal effects must be computed to interpret how changes in the independent variable affect the probability of an individual's response being j . Thus, given a variation in the independent variable x_i , the probability of response j occurring is given by Eq. (4):

$$\frac{\partial \Pr[y_i = j]}{\partial x_i} = \{F'(\alpha_{j-1} - x_i'\beta) - F'(\alpha_j - x_i'\beta)\}\beta \quad (4)$$

with F' being the derivative of F .

4. Results

4.1. Descriptive statistics and unadjusted relationships

Fig. 1 shows the reported feelings of safety by respondents in urban and rural areas in Brazil from 2008 to 2018. Although there was an initial increase in perceived safety from 2008 to 2012 in both rural and urban areas, this trend was discontinued in subsequent years. Starting from 2012, when over half of rural residents versus only a quarter of

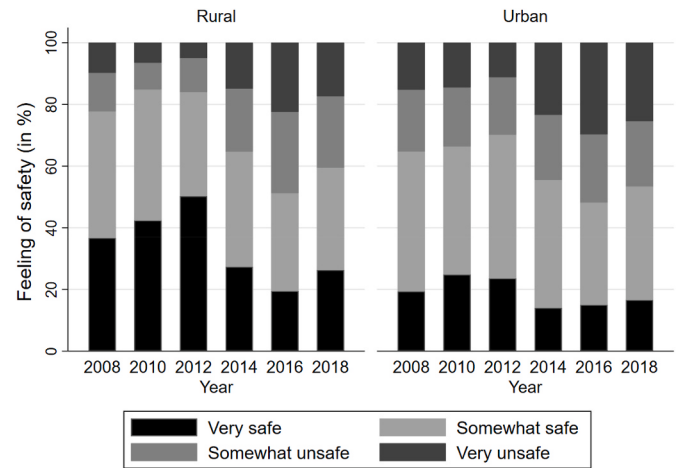


Fig. 1. – Perceptions of safety in rural and urban areas in Brazil, 2008–2018.

urban residents felt "very safe," those residing in rural areas experienced a greater decline in their sense of safety compared to those living in urban areas. By 2018, only 26% of rural residents and 17% of urban residents reported feeling "very safe".

Table 1 presents descriptive statistics for demographic and socioeconomic variables categorised by perceived levels of safety (very safe, somewhat safe, somewhat unsafe, and very unsafe) in urban and rural areas in Brazil from 2008 to 2018. Although rural residents more often state that they feel safer than those living in urban areas, safety perceptions vary significantly across the country, with respondents in the South and Southeast regions of Brazil reporting higher levels of perceived safety than those in other regions, regardless of whether they lived in rural or urban areas. Additionally, rural regions in the North and Northeast have proportionally fewer people who report feeling "very safe" and more people who report feeling "very unsafe" compared to other regions of the country.

The component of "policy legitimacy" (trust in the police) is noteworthy for its importance to the safety of people living in rural areas: The higher the level of trust in the police, the higher the proportion of people who say they feel "very safe", with this trend being stronger for rural areas than urban areas (43% of those who trust the police very much – value 7 – reported "very safe" in rural areas, compared to 28% in urban areas).

Those who were previously victimized by crime declared feeling less safe than those who had not experienced victimisation. This trend is observed in both urban and rural areas. However, among previously victimized people, only 12% in urban areas declared feeling "very safe", while this percentage is 22% in rural areas, indicating that previous victimisation has a greater influence on deteriorating the safety perception in urban areas than in rural areas.

In terms of demographic characteristics, women declare feeling less safe than men in both urban and rural areas (with 21% of women reporting feeling "very unsafe" in urban areas compared to 16% of men; in rural areas, 14% of women reported feeling "very unsafe" compared to 9% of men). Regarding racial composition, the proportion of white individuals reporting "very safe" in rural areas is higher than non-white individuals. However, in urban areas, this relationship is reversed; white individuals are proportionally more likely to report feeling unsafe than non-white individuals.

For socioeconomic characteristics, individuals with a higher education degree in both urban and rural areas tend to feel less safe, possibly due to their heightened awareness of the risk of victimization. This relationship is more pronounced in urban areas, where only 21% of the population with higher education reported feeling "very safe", while this percentage in rural areas was 36%. On the other hand, nearly half of the rural population with no schooling declared feeling "very safe",

Table 1

Descriptive statistics categorised by level of safety and for both urban and rural areas in Brazil.

Variable	Urban								Rural							
	V.S.		S.S.		S.U.		V.U.		V.S.		S.S.		S.U.		V.U.	
	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Non-white	0.20	0.01	0.43	0.01	0.19	0.01	0.18	0.01	0.33	0.02	0.39	0.02	0.16	0.01	0.12	0.01
White	0.19	0.01	0.40	0.01	0.21	0.01	0.20	0.01	0.36	0.02	0.37	0.02	0.15	0.01	0.11	0.01
Non-employed	0.20	0.01	0.39	0.01	0.21	0.01	0.19	0.01	0.33	0.02	0.38	0.02	0.17	0.01	0.13	0.01
Employed	0.19	0.01	0.43	0.01	0.19	0.01	0.19	0.01	0.36	0.02	0.38	0.02	0.15	0.01	0.11	0.01
Woman	0.18	0.01	0.40	0.01	0.21	0.01	0.21	0.01	0.33	0.02	0.38	0.02	0.15	0.01	0.14	0.01
Man	0.21	0.01	0.43	0.01	0.20	0.01	0.16	0.01	0.36	0.02	0.38	0.02	0.16	0.01	0.09	0.01
Age	40.58	16.40	38.58	15.66	39.25	15.91	39.30	15.58	40.32	16.42	39.26	15.99	40.27	15.82	38.29	16.34
Non-victim	0.21	0.00	0.42	0.01	0.20	0.00	0.16	0.00	0.36	0.01	0.38	0.01	0.16	0.01	0.10	0.01
Victim	0.12	0.01	0.38	0.01	0.20	0.01	0.30	0.01	0.22	0.03	0.37	0.04	0.13	0.03	0.28	0.03
Homicide rate	29.1	12.5	29.1	12.5	29.1	12.5	29.1	12.5	29.1	12.5	29.1	12.5	29.1	12.5	29.1	12.5
No schooling	0.29	0.03	0.32	0.03	0.26	0.03	0.13	0.02	0.48	0.05	0.29	0.04	0.13	0.03	0.10	0.03
Elementary school	0.21	0.01	0.40	0.01	0.21	0.01	0.18	0.01	0.35	0.02	0.38	0.02	0.17	0.01	0.10	0.01
High school	0.17	0.01	0.43	0.01	0.20	0.01	0.20	0.01	0.30	0.02	0.39	0.02	0.15	0.02	0.17	0.02
Higher education	0.21	0.01	0.44	0.01	0.16	0.01	0.19	0.01	0.36	0.05	0.51	0.06	0.06	0.03	0.07	0.03
Trust in the police (=1)	0.18	0.01	0.36	0.01	0.17	0.01	0.29	0.01	0.23	0.03	0.36	0.04	0.18	0.03	0.23	0.03
Trust in the police (=2)	0.15	0.01	0.44	0.02	0.20	0.01	0.21	0.01	0.36	0.04	0.34	0.04	0.13	0.03	0.17	0.03
Trust in the police (=3)	0.16	0.01	0.41	0.01	0.22	0.01	0.20	0.01	0.24	0.03	0.40	0.04	0.22	0.03	0.14	0.03
Trust in the police (=4)	0.18	0.01	0.45	0.01	0.21	0.01	0.16	0.01	0.35	0.03	0.44	0.03	0.12	0.02	0.10	0.02
Trust in the police (=5)	0.19	0.01	0.45	0.01	0.22	0.01	0.15	0.01	0.36	0.03	0.40	0.03	0.13	0.02	0.11	0.02
Trust in the police (=6)	0.24	0.01	0.42	0.02	0.20	0.01	0.13	0.01	0.37	0.03	0.40	0.03	0.14	0.02	0.08	0.02
Trust in the police (=7)	0.28	0.01	0.35	0.01	0.19	0.01	0.17	0.01	0.43	0.03	0.30	0.03	0.19	0.02	0.08	0.02
North	0.16	0.01	0.41	0.01	0.22	0.01	0.21	0.01	0.33	0.03	0.41	0.03	0.14	0.02	0.12	0.02
Northeast	0.14	0.01	0.36	0.01	0.24	0.01	0.25	0.01	0.30	0.02	0.41	0.02	0.16	0.01	0.13	0.01
Central-West	0.18	0.01	0.40	0.01	0.19	0.01	0.23	0.01	0.36	0.04	0.40	0.04	0.12	0.03	0.11	0.02
Southeast	0.21	0.01	0.44	0.01	0.20	0.01	0.15	0.01	0.44	0.03	0.27	0.03	0.18	0.02	0.11	0.02
South	0.25	0.01	0.43	0.01	0.16	0.01	0.15	0.01	0.41	0.03	0.35	0.03	0.14	0.02	0.10	0.02
2008	0.19	0.01	0.45	0.01	0.20	0.01	0.15	0.01	0.37	0.02	0.41	0.02	0.13	0.01	0.10	0.01
2010	0.25	0.01	0.42	0.01	0.19	0.01	0.15	0.01	0.42	0.03	0.42	0.03	0.09	0.02	0.07	0.01
2012	0.24	0.01	0.47	0.01	0.19	0.01	0.11	0.01	0.50	0.04	0.34	0.04	0.11	0.02	0.05	0.02
2014	0.14	0.01	0.42	0.01	0.21	0.01	0.23	0.01	0.27	0.03	0.37	0.03	0.20	0.03	0.15	0.03
2016	0.15	0.01	0.33	0.01	0.22	0.01	0.30	0.01	0.20	0.03	0.32	0.03	0.26	0.03	0.22	0.03
2018	0.17	0.01	0.37	0.01	0.21	0.01	0.25	0.01	0.26	0.03	0.33	0.03	0.23	0.03	0.17	0.03

Note: V.S.: very safe; S.S.: somewhat safe; S.U.: somewhat unsafe; V. U.: very unsafe.

indicating that safety perception is not positively correlated with individuals' level of education.

In the following section, we present the marginal effects of people's reported safety perceptions in rural and urban areas of Brazil between

2008 and 2018. We will now discuss the similarities and differences observed between these two contexts.

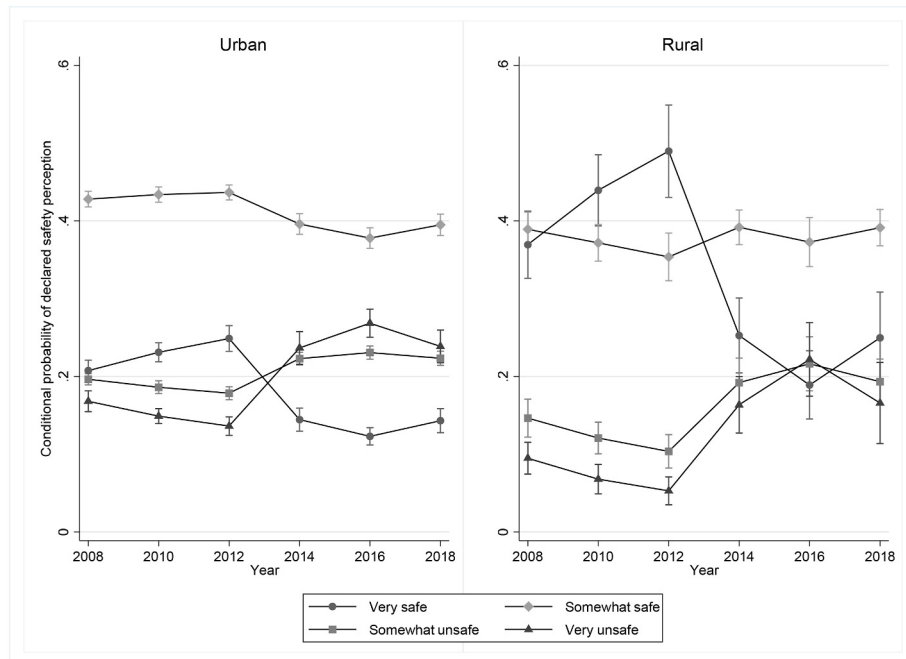


Fig. 2. – Conditional probability of safety perceptions in Brazil – urban and rural (2008–2018).

4.2. Modelling safety perceptions in Brazil from 2008 to 2018: urban and rural areas

Fig. 2 illustrates the conditional probabilities of individuals' safety perceptions. It indicates a sharp decrease in the percentage of respondents who declared feeling "very safe" in rural areas in Brazil, accompanied by an increase in the likelihood of reporting feeling "somewhat unsafe" and "very unsafe" up to 2018. A similar trend was observed in urban areas, but the decline was less pronounced than in rural areas. This result was obtained from the empirical estimates presented in Table 2.

According to Table 2, individuals who trust the police to a great extent have a 9.12 p.p. higher probability of feeling "very safe" in urban areas and a 15.06 p.p. higher probability in rural areas compared to those who do not trust the police at all. This result indicates that trust in the police plays a more crucial role in increasing safety perceptions in rural contexts than in urban contexts.

While homicide rates (used here as an indication of violence in the area) do not impact respondents' safety perceptions as initially

expected, previous personal victimisation and lack of trust in the police do, especially in rural areas where the estimated coefficients are larger. Previous victimisation increases the likelihood of declaring oneself as "somewhat unsafe" or "very unsafe" in both rural and urban areas. In urban areas, individuals who have been victimized before have a 9.52 percentage point (p.p.) lower likelihood of declaring themselves "very safe" compared to those who have not, while in rural areas, the probability is reduced by 15.45 p.p.

Note that the results presented in Table 2 regarding the declared perceived safety in different Brazilian regions are consistent with those observed in Table 1 and some variations between urban and rural environments are worth noting. In rural areas, individuals residing in the Northeast region are less likely to report feeling "very safe" than those living in the North region. However, no statistically significant differences were found between individuals from the other regions and those from the North region in terms of the "very safe" statement. These findings suggest that individual and contextual factors are the primary determinants of respondents' safety perceptions in rural areas across the North, Centre-west, Southeast, and South regions. Among those

Table 2
Marginal effects on conditional probability of perceived safety in rural and urban areas in Brazil (2008–2018).

	Urban				Rural			
	Very safe	Somewhat safe	Somewhat unsafe	Very unsafe	Very safe	Somewhat safe	Somewhat unsafe	Very unsafe
White	0.0048 (0.00671)	0.0020 (0.00278)	−0.0020 (0.00276)	−0.0048 (0.00673)	0.0489* (0.0182)	−0.0051** (0.00208)	−0.0178* (0.00675)	−0.0260* (0.00993)
Employed	0.0055 (0.00698)	0.0023 (0.00290)	−0.0023 (0.00287)	−0.0055 (0.00701)	0.0506** (0.0235)	−0.0053** (0.00267)	−0.0184** (0.00882)	−0.0269** (0.0125)
Man	0.0479* (0.00720)	0.0198* (0.00307)	−0.0198* (0.00301)	−0.0480* (0.00721)	0.0374 (0.0235)	−0.0039 (0.00254)	−0.0136 (0.00853)	−0.0199 (0.0127)
Age	−0.0007* (0.000196)	−0.0003* (0.0000820)	0.0003* (0.0000810)	0.0007* (0.000196)	−0.0005 (0.000717)	0.0001 (0.0000737)	0.0002 (0.000266)	0.0003 (0.000379)
Victim	−0.0952* (0.00648)	−0.0394* (0.00311)	0.0393* (0.00269)	0.0953* (0.00670)	−0.1545* (0.0348)	0.0161* (0.00499)	0.0562* (0.0131)	0.0821* (0.0195)
Trust in the police (=2)	0.0206*** (0.0109)	0.0135*** (0.00741)	−0.0081*** (0.00426)	−0.0261*** (0.0141)	0.0612 (0.0423)	0.0038 (0.00453)	−0.0229 (0.0158)	−0.0421 (0.0282)
Trust in the police (=3)	0.0219*** (0.0112)	0.0142*** (0.00748)	−0.0086*** (0.00438)	−0.0276*** (0.0143)	0.0171 (0.0336)	0.0023 (0.00463)	−0.0064 (0.0125)	−0.0130 (0.0256)
Trust in the police (=4)	0.0478* (0.0118)	0.0266* (0.00722)	−0.0193* (0.00488)	−0.0551* (0.0141)	0.1116* (0.0370)	−0.0009 (0.00604)	−0.0417* (0.0145)	−0.0690* (0.0236)
Trust in the police (=5)	0.0606* (0.0113)	0.0313* (0.00675)	−0.0247* (0.00480)	−0.0672* (0.0131)	0.0958* (0.0324)	0.0012 (0.00533)	−0.0359* (0.0121)	−0.0612* (0.0225)
Trust in the police (=6)	0.0926* (0.0131)	0.0392* (0.00641)	−0.0384* (0.00558)	−0.0934* (0.0133)	0.1177* (0.0386)	−0.0019 (0.00635)	−0.0439* (0.0141)	−0.0718* (0.0249)
Trust in the police (=7)	0.0912* (0.0125)	0.0389* (0.00643)	−0.0377* (0.00507)	−0.0923* (0.0133)	0.1506* (0.0369)	−0.0086 (0.00724)	−0.0558* (0.0137)	−0.0862* (0.0236)
Homicide rate	0.0001 (0.000321)	0.0000 (0.000133)	−0.0000 (0.000132)	−0.0001 (0.000321)	0.0014 (0.00133)	−0.0001 (0.000149)	−0.0005 (0.000490)	−0.0007 (0.000701)
Elementary school	−0.0670** (0.0304)	−0.0143* (0.00267)	0.0281** (0.0128)	0.0532* (0.0201)	−0.0980** (0.0491)	0.0208 (0.0150)	0.0348** (0.0169)	0.0424** (0.0178)
High school	−0.0851* (0.0293)	−0.0221* (0.00273)	0.0356* (0.0124)	0.0716* (0.0190)	−0.1319* (0.0456)	0.0230 (0.0149)	0.0474* (0.0161)	0.0615* (0.0174)
Higher education	−0.0570*** (0.0313)	−0.0108* (0.00368)	0.0240*** (0.0131)	0.0439** (0.0212)	−0.0340 (0.0669)	0.0094 (0.0190)	0.0118 (0.0231)	0.0128 (0.0249)
Northeast	−0.0343* (0.0112)	−0.0252* (0.00821)	0.0131* (0.00433)	0.0463* (0.0151)	−0.0896* (0.0274)	0.0036 (0.00379)	0.0329* (0.0104)	0.0531* (0.0154)
Centre-west	−0.0024 (0.0104)	−0.0015 (0.00627)	0.0010 (0.00423)	0.0029 (0.0125)	0.0176 (0.0392)	−0.0030 (0.00691)	−0.0063 (0.0141)	−0.0083 (0.0182)
Southeast	0.0590* (0.0110)	0.0238* (0.00553)	−0.0250* (0.00459)	−0.0578* (0.0118)	0.0711 (0.0439)	−0.0160 (0.0110)	−0.0251 (0.0153)	−0.0300*** (0.0182)
South	0.0758* (0.0136)	0.0271* (0.00557)	−0.0322* (0.00576)	−0.0707* (0.0131)	0.0498 (0.0398)	−0.0102 (0.00897)	−0.0177 (0.0142)	−0.0219 (0.0170)
2010	0.0235** (0.0104)	0.0059** (0.00244)	−0.0102** (0.00445)	−0.0191** (0.00836)	0.0699** (0.0353)	−0.0174*** (0.00982)	−0.0256** (0.0124)	−0.0269** (0.0135)
2012	0.0412* (0.00942)	0.0086* (0.00183)	−0.0179* (0.00398)	−0.0320* (0.00704)	0.1203* (0.0332)	−0.0355* (0.0116)	−0.0428* (0.0115)	−0.0420* (0.0115)
2014	−0.0631* (0.00870)	−0.0320* (0.00487)	0.0265* (0.00373)	0.0686* (0.00981)	−0.1168* (0.0288)	0.0025 (0.00523)	0.0456* (0.0123)	0.0686* (0.0185)
2016	−0.0846* (0.00894)	−0.0501* (0.00666)	0.0344* (0.00377)	0.1003* (0.0118)	−0.1804* (0.0330)	−0.0164 (0.0108)	0.0698* (0.0140)	0.1270* (0.0279)
2018	−0.0645* (0.00946)	−0.0330* (0.00597)	0.0270* (0.00396)	0.0705* (0.0114)	−0.1198* (0.0320)	0.0020 (0.00684)	0.0468* (0.0132)	0.0710* (0.0231)

Note: Urban: N = 8663; AIC = 2210; Rural: N = 1490; AIC = 3652; Standard errors in parentheses. *** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$.

declaring feeling “very unsafe”, only respondents from the Southeast region were found to have a lower probability of feeling very unsafe compared to those from the North region. In urban areas, the Centre-west and North regions did not show any significant differences. However, individuals living in the Southeast and South regions showed a higher probability of reporting feeling “very safe” compared to those living in the Northern regions of Brazil.

No significant gender difference was found in safety perceptions in rural areas in the modelling section. However, in urban areas, men are more prone to state a higher level of safety compared to women. In urban areas, no statistically significant variation was observed in the stated safety perception concerning an individual’s ethnical background, but in rural areas, white individuals are more likely to feel “very safe” than blacks or individuals of another ethnic background. Regarding education, higher-educated individuals are more likely to report a poor safety perception in both urban and rural areas, compared to those with no formal education. The outcome for the age variable is not significant for the rural region and exhibits a low and statistically significant magnitude for the urban setting. This finding supports our descriptive statistics, indicating that safety perceptions remain relatively stable across different age groups, with only significant changes occurring among the elderly. As our sample only contains 1% of individuals over 80 years old, which was not flagged by the empirical model. Finally, the variable “employed”, which measures the employed population and was added to the model as an indicator of exposure to public life, did not show any variation between workers and non-workers in urban areas. However, in rural areas, individuals who work are more likely to state they feel safer than those with no employment.

5. Discussion of the results

On average, only a fifth of the population in Brazil say that they feel very safe. Similar figures of poor safety perceptions are found in Ecuador and Mexico — countries that share similarities with Brazil in terms of high levels of violence and socio-economic inequalities (IEP, 2021). Although rural residents more often state that they feel safer than those living in urban areas, evidence also shows that the overall perception of safety has deteriorated since 2012, especially in rural areas (the percentage of individuals who said they felt very safe decreased from 50% in 2012 to 26% in 2018), irrespective of individual characteristics. Although it is difficult to identify the precise causal mechanisms for this decline, researchers attribute it to the worsening of the country’s economic conditions, political instability, and an increase in violence in rural areas (BFPS, 2022a). Although homicide rates in Brazil have decreased in recent years (2019–2022), there has been a simultaneous increase in property and cybercrimes across the entire country (Kahn, n.d.), which is likely to have contributed to declared perceived safety.

Our findings confirm previous literature about the importance of police legitimacy in defining levels of fear of crime (Taylor et al., 2015). Poor trust in the police negatively affects safety perceptions. In rural areas, in particular, poor police services lead to low levels of public confidence in the police (Wakefield and Fleming, 2009), directly affecting people’s safety perceptions. Although most countries around the world have seen a pluralisation of the police function, with cooperation between public, private, and civil society in policing activities (Loader, 2000; O’Neill and Fyfe, 2017), the security discourse still remains focused on the role of the police as security providers. Given the importance of public institutions in safeguarding communities, particularly in rural areas where resources and services may already be limited, addressing issues related to police trust becomes crucial for the safety of the population. By strengthening the accountability of the police services in rural areas, it is possible to contribute to the enhancement of safety perceptions among those living in the most remote parts of the country.

Our results also indicate that poor safety perceptions follow a distinct regional and rural-urban pattern, where rural residents more often state

that they feel safer than those living in urban areas. In rural areas, individual characteristics such as race, employment status, previous experience of victimisation, and level of education play a more significant role in determining safety perceptions, while contextual differences are less pronounced. In rural areas, respondents living in the Northeast region of Brazil consistently show poorer safety perceptions than those from the other five regions, even after checking for other factors. In contrast, in urban areas, people’s safety perceptions are closely linked to the region in which they live. Respondents from the Southeast and Southern regions consistently report higher levels of perceived safety compared to those from other regions in the country. In Brazil, it is understandable that the findings make sense given that public security policies mostly target the areas where most problems are, namely urban areas, which are direct recipients of federal government guidelines and resources. Conversely, in rural areas, efforts to combat crime or coordinate crime prevention actions (that are meaningful for the local realities of rural residents) are often left to the residents’ own capacity and/or resources to defend themselves and their families (Aransiola et al., 2022). A lack of trust in the police makes people take justice into their own hands (Goldstein, 2003). This is not unique to Brazil but shows instead clear parallels with other countries which suffer equally from a lack of access to police services and to justice in general (Harkness, 2015), imposed partially by large territories.

Despite the results regarding how individual characteristics affect declared safety perceptions being consistent with empirical studies that have investigated the influence of individual characteristics on safety perceptions, such as those conducted by Schafer et al. (2006), Scarborough et al. (2010), Allik and Kearns (2017), and Davanzo et al. (2021), we show that the declared safety patterns are far from being homogenous by individual groups of society or within rural and urban areas. In rural areas, for example, the variable indicating the ethnical background of respondents turned out to be statistically significant, reflecting the greater vulnerability of non-whites in these areas and consequently reflecting on their poor safety perceptions (see e.g. Garland and Chakraborti, 2006). In urban areas, men and young people in particular are more likely to report greater safety perceptions than women, indicating the vulnerability of women and older adults in urban settings. Women are particularly vulnerable to (sexual) victimisation and are more likely to experience violence in their daily routines (Hautzinger, 2007; Moreira and Ceccato, 2021).

We observed that area levels of homicides have no effect on individuals’ safety perceptions. The relationship between area-level violence and individual perceptions is complex and has been discussed in previous literature. For instance, Wyant (2008) found no statistical relationship between fear of crime and violent crimes in the neighbourhood, suggesting that even when violent crime rates are high, individuals may not perceive themselves at risk of victimisation. However, Zhao et al. (2015) found a small positive association between crime and fear in Houston (USA). Both studies used data on crime incidence at the micro level, where the individual resides, while in our research, we utilised an aggregated indicator of homicides based on the federation unit where the individual lives. Given that violent crimes are highly concentrated in certain municipalities in Brazil (Andrade and Diniz, 2013), this did not influence the safety perceptions of our sample.

Although living in areas with high homicide rates has no effect on safety perceptions, respondents’ previous experience of victimisation does impact negatively on safety perceptions, with a greater impact on those residents living in rural areas than in urban areas (victims are 15% less likely to state they feel “very safe” in rural areas while in urban areas the figure is 9%). As research has previously shown, being a victim of a crime is a stressful situation that can cause traumas affecting declared safety perception and trust in people (Abbott and McGrath, 2017; Agnew et al., 2011; Nalla et al., 2011). The impact of previous experience of victimisation on the probability of rural respondents declaring themselves as “very safe” is amplified by the remoteness of rural locations and most likely, poor access to police services and criminal justice

in general. For example, the North, Northeast, and Centre-west regions, which have the lowest population density in Brazil, also exhibit the lowest proportion of individuals declaring themselves as very safe in the country's rural areas.

Although safety perceptions drop both in urban and rural areas, this decline has had a greater impact on rural areas. On top of the global economic downturn, in recent years, Brazil has faced fiscal challenges that affect public spending on public security policies (BFSP, 2022b), as well as large fluctuations in employment rates and income levels (IBGE, 2023) that have inevitably affected the inequalities between those living in urban and rural areas (United Nations Development Programme et al., 2017). The disparities in economic opportunities and societal resources between these regions can exacerbate feelings of overall anxiety in rural areas, where access to employment, services, and basic health and security infrastructure may be limited, contributing to feelings of distrust in society and public authorities (Cox, 2017; Edwards et al., 2001; Jansson, 2013).

6. Concluding remarks

Only a fifth of the population say that they feel very safe in Brazil, but rural residents, in particular men, say they feel safer than their urban counterparts and women in general. These findings highlight the need for assessing individual and contextual factors in influencing people's declared safety perceptions. A significant reduction in people's perceived safety in both rural and urban areas from 2012 was also noticed, with a more substantial decline being observed in rural areas. Inequalities in victimisation and poor access to basic services, including a loss of confidence in the police, are associated with such a reduction in safety. Therefore, tailored policies aiming to reduce inequalities in victimisation and reinforcing public institutions and policy legitimacy can be ways forward to enhancing safety across the country, recognising the specific safety needs of different groups.

The police affect an individual's safety perception in at least two ways. By being present, the police can prevent crime, reduce victimisation, and consequently decrease fear of crime. The second way is that the police represent the presence of public authorities at the local level and a symbol of order and control. Thus, rural areas with no police force may suffer double the consequences, lower levels of perceived safety because of crime in certain areas and lack of police services.

As a limitation of the study, only one set of variables was examined to

assess their impact on declared safety perception, while other potential factors that could influence this perception, such as income or media exposure, were not considered due to limitations in the dataset. Therefore, the results should be interpreted as conditional probabilities rather than causal effects.

This research presents several potential directions for future investigation. One important area of inquiry would be to explore the potential reasons for the decrease in people's safety perceptions in Brazil since the early 2010s, in particular in rural areas beyond the ones assessed here. This could involve examining factors such as government policies in greater detail. Comparative studies between Brazil and other countries, particularly those with similar socio-economic and political contexts, could also provide valuable insights into the distinctive factors that influence safety perceptions in rural Brazil. Such insights could help inform policy decisions aimed at enhancing public safety in particular in rural areas.

CRediT authorship contribution statement

Gustavo Moreira: Conceptualization, Data curation, Formal analysis, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **Vania Ceccato:** Conceptualization, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

I declare no conflicts of interest regarding the submitted manuscript.

Data availability

Data will be made available on request.

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Appendix A.1. Explanatory variables used for empirical modelling

Variable	Description
White	Binary variable coded as 1 if the individual is white and 0 otherwise.
Employed	Binary variable coded as 1 if the individual is employed and 0 otherwise.
Man	Binary variable coded as 1 for male and 0 for female individuals.
Age	Age in years.
No schooling	Schooling level, with no schooling as the benchmark.
Elementary school	
High school	
Higher education	
Victim	Binary variable coded as 1 if the individual has been a victim of any type of crime in the past 12 months and 0 otherwise.
Trust in the police	Categorical variable ranging from 1 (not at all) to 7 (a lot) for the question: "To what extent do you trust in the Military Police?"
Homicide rate	Homicide rate per 100,000 inhabitants for the 27 Federation Units.
North	Variables for the five macroregions of Brazil, with the North region as the benchmark.
Northeast	
Central-West	
Southeast	
South	
2008	Year dummies, with 2008 as the benchmark.
2010	
2012	
2014	
2016	
2018	

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