Research, Society and Development, v. 14, n. 12, e176141250400, 2025
(CC BY 4.0) | ISSN 2525-3409 | DOI: http://dx.doi.org/10.33448/rsd-v14i12.50400

Incidence of self-inflicted violence in Brazil during the COVID-19 pandemic: An analysis of the Brazilian Notifiable Diseases Information System (SINAN) notifications

Incidência de violência autoprovocada no Brasil durante a pandemia de COVID-19: Uma análise das notificações do Sistema de Informação de Agravos de Notificação (SINAN)

Incidencia de la violencia autoinfligida en Brasil durante la pandemia de COVID-19: Un análisis de las notificaciones del Sistema de Información de Enfermedades de Notificación Obligatoria (SINAN)

Received: 12/10/2025 | Revised: 12/22/2025 | Accepted: 12/23/2025 | Published: 12/25/2025

Alice Garcia Pádua
ORCID: https://orcid.org/0000-0003-2820-178X
Pontifical Catholic University of Minas Gerais, Brazil
E-mail: alicepadua133@gmail.com
Felipe Rodrigues Santiago
ORCID: https://orcid.org/0009-0004-7061-0151
Pontifical Catholic University of Minas Gerais, Brazil
E-mail: dfm130824@gmail.com
Lázaro Pinto Medeiros Neto
ORCID: https://orcid.org/0000-0001-5008-7683
Pontifical Catholic University of Minas Gerais, Brazil
E-mail: lpmn_777@yahoo.com.br

Abstract
Self-inflicted violence is a global collective health issue, which is constantly driven by the development of mental disorders and socioeconomic, cultural and interpersonal issues that affect the population. This study aims to investigate the influence of the COVID-19 pandemic on notifications of self-inflicted violence in Brazil and characterize an epidemiological profile using sociodemographic data and other variables, to identify variations in epidemiological profiles and potential underreporting during the pandemic period. Thus, notifications were lifted in the period from 2018 to 2024. The data were analyzed qualitatively, generating an epidemiological and statistical profile, through the Poisson regression test and the negative binomial model. The epidemiological profile characterized points to a predominance of female, white, aged 20 to 29 years and adult life cycle, with complete high school. In addition, self-violence occurred predominantly in one's own home and through poisoning. The results showed a significant increase in notifications of self-inflicted violence in individuals of the mixed-race ("Pardo"), with complete high school education and who already perform this series of behaviors repeatedly. Data filled in as ignored or left blank in the variable race, 5th to 8th grade of elementary school, 15 to 19 years, life cycle (adolescence), and violence considered as non-repetitive or ignored showed a decrease compared to previous years. Thus, it was possible to evidence changes in epidemiological data in the pandemic period, reflecting possible underreporting of self-inflicted violence, evidencing the need for improvements in the notification system, aiming at the availability of real data.
Keywords: Self-injurious behavior; Pandemic; Self-harm violence; COVID-19.

Resumo
A violência autoprovocada é uma questão de saúde coletiva global, que é constantemente impulsionada pelo desenvolvimento de transtornos mentais e questões socioeconômicas, culturais e interpessoais que afetam a população. Este estudo tem como objetivo investigar a influência da pandemia de COVID-19 nas notificações de violência auto-infligida no Brasil e caracterizar um perfil epidemiológico usando dados sociodemográficos e outras variáveis, para identificar variações nos perfis epidemiológicos e possível subnotificação durante o período pandêmico. Assim, foram levantadas as notificações no período de 2018 a 2024. Os dados foram analisados de forma qualitativa, gerando um perfil epidemiológico e estatisticamente, por meio dos testes de regressão de Poisson e modelo binomial negativo. O perfil epidemiológico caracterizado aponta predomínio de indivíduos do sexo feminino, brancas, na faixa etária de 20 a 29 anos e ciclo de vida adulto, com ensino médio completo. Além disso, a

autoviolência ocorreu predominantemente, na própria residência e por meio de envenenamento. Os resultados encontrados evidenciaram um aumento significativo de notificações por violência autoprovocada em indivíduos da raça parda, com ensino médio completo e que já realizam essa série de comportamentos repetidamente. Dados preenchidos como ignorados ou deixados em branco na variável raça, 5° a 8° série do ensino fundamental, 15 a 19 anos, ciclo de vida (adolescência), e violências consideradas como não repetitivas ou ignoradas apresentaram diminuição comparado aos anos anteriores. Assim, foi possível evidenciar mudanças nos dados epidemiológicos no período pandêmico, refletindo possíveis subnotificações de violência autoprovocada, evidenciando a necessidade de melhorias no sistema de notificações, visando a disponibilidade de dados reais.
Palavras-chave: Comportamento autodestrutivo; Pandemia; Violência autoprovocada; COVID-19.

Resumen
La violencia autoinfligida es un problema de salud colectiva global, que está constantemente impulsado por el desarrollo de trastornos mentales y problemas socioeconómicos, culturales e interpersonales que afectan a la población. Este estudio tiene como objetivo investigar la influencia de la pandemia de COVID-19 en las notificaciones de violencia autoinfligida en Brasil y caracterizar un perfil epidemiológico utilizando datos sociodemográficos y otras variables, para identificar variaciones en los perfiles epidemiológicos y posibles subnotificaciones durante el periodo pandémico. Por lo tanto, las notificaciones se levantaron en el período de 2018 a 2024. Los datos se analizaron cualitativamente, generando un perfil epidemiológico y estadístico, a través de la prueba de regresión de Poisson y el modelo binomial negativo. El perfil epidemiológico caracterizado apunta a un predominio del sexo femenino, blanco, con edad de 20 a 29 años y ciclo vital adulto, con escolaridad media completa. Además, la autoviolencia ocurría predominantemente en el propio hogar y a través del envenenamiento. Los resultados mostraron un aumento significativo de las notificaciones de violencia autoinfligida en individuos de raza mestiza ("Parda"), con educación secundaria completa y que ya realizan esta serie de conductas de forma reiterada. Los datos completados como ignorados o dejados en blanco en la variable raza, 5º a 8º grado de primaria, 15 a 19 años, ciclo de vida (adolescencia) y violencia considerada como no repetitiva o ignorada mostraron una disminución en comparación con años anteriores. Así, fue posible evidenciar cambios en los datos epidemiológicos en el período de pandemia, reflejando un posible subregistro de violencia autoinfligida, evidenciando la necesidad de mejoras en el sistema de notificación, apuntando a la disponibilidad de datos reales.
Palabras clave: Conducta autodestructiva; Pandemia; Violencia autoprovocada; COVID-19.

1. Introduction

Self-inflicted violence or injury refers to intentional behaviors by an individual aimed at causing lethal or non-lethal harm to themselves. These injuries can be physical or psychological and are linked to stress and psychological distress (WHO, 2002).

The etiology of these behaviors is multifactorial, encompassing daily events such as socioeconomic difficulties and interpersonal relationship problems, grief, physical illness, and work-related stress, as well as risk factors like licit and illicit drug abuse, various forms of violence, and psychiatric disorders. It is important to note that, in addition to the aforementioned factors, a history of suicidal ideation, concrete suicide attempts, and access to the means to commit such acts significantly increase the likelihood of violence (WHO, 2022).

Individuals who commit self-inflicted violence seek emotional relief through physical pain and tension. Despite being a relevant issue affecting a large portion of the population, the biochemical and physiological changes occurring in the human body during this type of violence remain poorly understood and studied due to methodological difficulties (Kirtley et al., 2015).

Some promising biological markers for monitoring self-inflicted violence include peripheral levels of cortisol, tryptophan, endocannabinoids, and C-reactive protein. However, further studies are needed to understand the pathophysiology behind these behaviors, underscoring the need for greater investment in mental health research and services (Johnston et al., 2022).

Within the Brazilian context, the number of violence notifications has grown significantly. This alarming growth is reflected not only in self-inflicted violence but also in interpersonal violence. Moreover, the majority of notifications come from the Southeast and South regions only, indicating potential underreporting in other regions of Brazil (Ministério da Saúde,

2025a).

The COVID-19 pandemic period, lasting from 2020 to 2022, was marked by challenges not only in physical but also in psychological health worldwide, as periods of social, economic, and political instability are linked to increased suicide attempts and self-inflicted violence. In this context, the COVID-19 pandemic can be considered a triggering factor for this type of violence, as social isolation, high unemployment rates, and constant grief and fear fostered feelings of loneliness, sadness, and hopelessness, which contribute to self-harm and suicide (Santos et al., 2024).

Countries with high SARS-CoV-2 infection rates, such as Brazil and other Latin American nations, were frequently associated with an increase in cases of generalized anxiety disorder and major depressive disorder, which are predisposing factors for self-inflicted violence and suicide attempts. However, the overload of healthcare systems, partial or total cancellation of mental health services, and the population's reluctance to seek specialized medical care due to high infection risk led to an inevitable decrease in notifications and epidemiological data concerning this issue (Santomauro et al., 2021).

Therefore, this study aims to investigate the influence of the COVID-19 pandemic on notifications of self-inflicted violence in Brazil and characterize an epidemiological profile using sociodemographic data and other variables, to identify variations in epidemiological profiles and potential underreporting during the pandemic period.

The obtained results contribute to the development of appropriate public policies, especially during crises such as pandemics, and to identifying potential flaws in the current notification system.

2. Methodology

An epidemiological, documentary survey was conducted using direct data from SINAN, and was quantitative in nature (Pereira et al., 2018) using simple descriptive statistics with column or bar graphs, data classes, percentage relative frequency values (Shitsuka et al., 2014) and statistical analysis (Vieira, 2021; Costa Neto & Bekman, 2009).

This study is a data survey utilizing publicly available information from the Notifiable Diseases Information System (SINAN), with the primary variable being notifications of self-inflicted violence. Sociodemographic data (sex, age group, life cycle of the perpetrator, race, and education) and event-related data (location, means used, repetitive violence) were used to construct the epidemiological profile. Additionally, data such as referral and case outcome were also evaluated.

For the article writing, databases such as PubMed, SciELO, and the CAPES Portal were used. Inclusion criteria included the period from 2018 to 2025, except for scientifically relevant articles outside this timeframe, languages English and Portuguese, and keywords such as "violência autoprovocada," "violência autoinfligida," "self-inflicted violence," and "self-harm." Exclusion criteria involved all articles not fitting the recommended period or language.

The obtained data were subjected to Poisson regression statistical analysis, a model using a logarithmic link function to model count variables over a specific time interval. Subsequently, data were reanalyzed using the negative binomial model, which also uses a logarithmic link function but is more suitable for data exhibiting overdispersion (Byers et al., 2003; Paulo, 2019). For all statistical tests, a significance level of 5% (p=0.05) was adopted. The statistical software Minitab® was used for these analyses.

3. Results

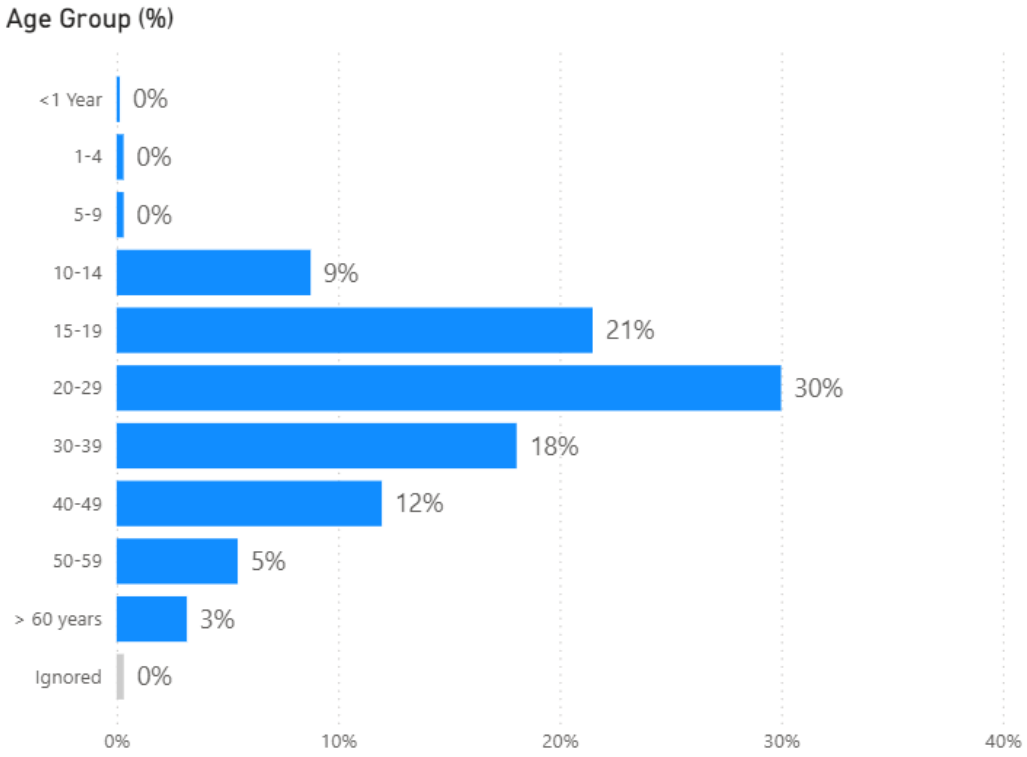
3.1 Epidemiological profile

To outline an epidemiological profile, the total number of variables such as sex, age group, life cycle, race, and education were analyzed, specifically during the pandemic period from 2020 to 2022.

Sociodemographic data obtained from mandatory SINAN notifications show that females had a higher number of notifications, with 247,045 recorded, while males registered 106,605 notifications of self-inflicted violence during this period.

Regarding age group (Figure 1), approximately 106,091 notifications were for individuals aged 20-29 years, representing the highest statistic, followed by individuals aged 30-39 years, totaling 80,084 cases. The life cycle of the perpetrator corroborates these data, as adults presented the highest rate, with approximately 164,165 notifications during the pandemic period.

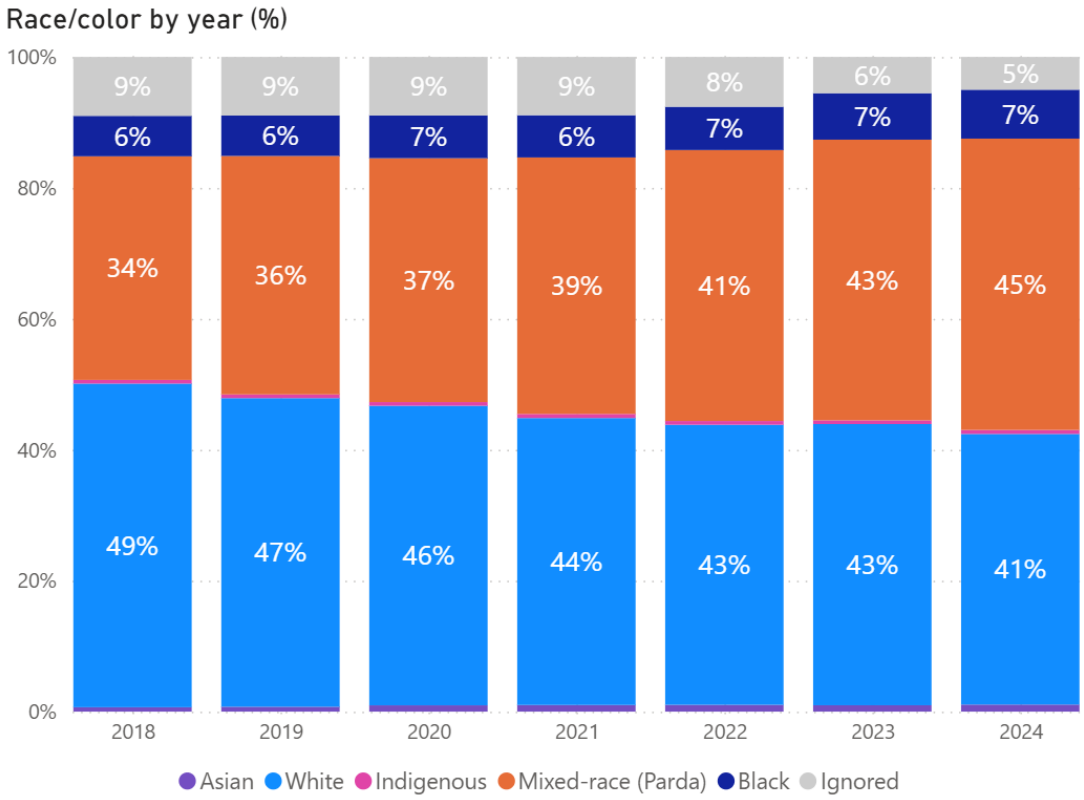
Figure 1. Notifications by age group during the pandemic period.



Source: Research Authors (2025).

Regarding race (Figure 2), the highest rates of self-inflicted violence were among White individuals, followed by Mixed-race ("Parda") individuals, who constitute approximately 43.5% and 45.3% of Brazil's total population, respectively, aligning with the country's ethnic data.

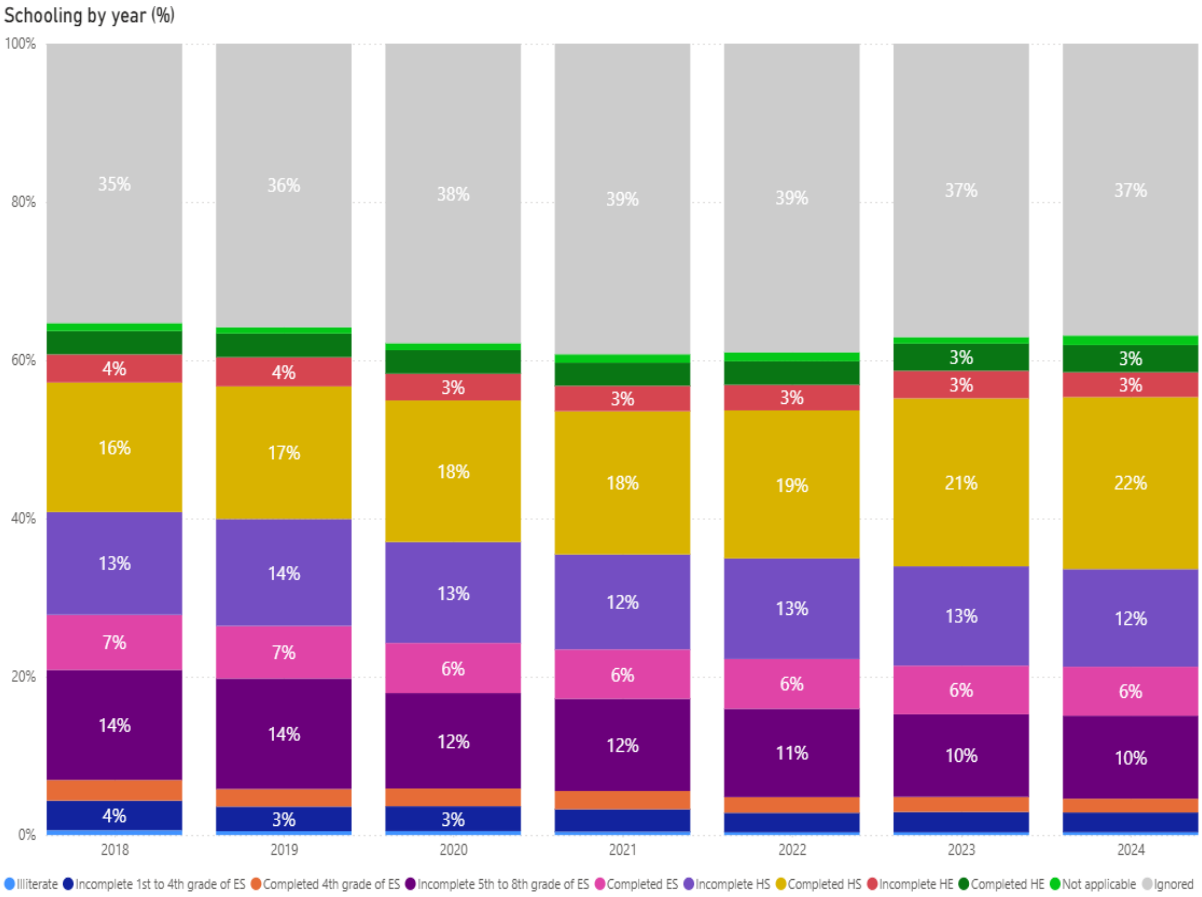
Figure 2. Race/color notifications by year.



Source: Research Authors (2025).

For the education variable (Figure 3), the majority of data were ignored or left blank, leading to an absence of completion in the mandatory notification form. The second highest rate belongs to individuals with complete high school education, with approximately 64,661 notifications between 2020 and 2022, corresponding to 35.8% of Brazil's total population.

Figure 3. Notifications of schooling year.



ES: Elementary School; HS: High School; HE: Higher Education.
Source: Research Authors (2025).

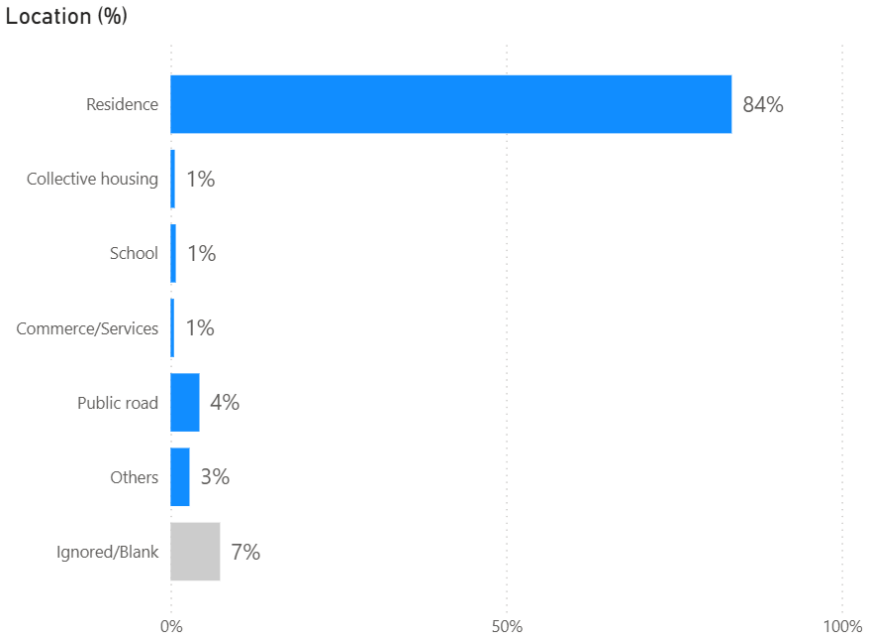
Based on the obtained data, it is possible to define the epidemiological profile of self-inflicted violence during the pandemic period as: female sex (69.9%), age 20-29 years (30.0%), adult life cycle (46.4%), White race (43.9%), complete high school education (30.8%), occurring at residence (83.6%), via poisoning/intoxication (66.2%), and being repetitive violence (42.5%).

3.2 Event data

Event data consist of the location of occurrence (Figure 4), means used, and whether the event constitutes repetitive violence.

During the pandemic period, the most frequent location of occurrence was the individual's own residence, with 295,750 notifications. However, it is noteworthy that notifications with this topic listed as ignored had approximately 25,341 records, the second highest data point for this topic.

Figure 4. Notifications by location during the pandemic period.

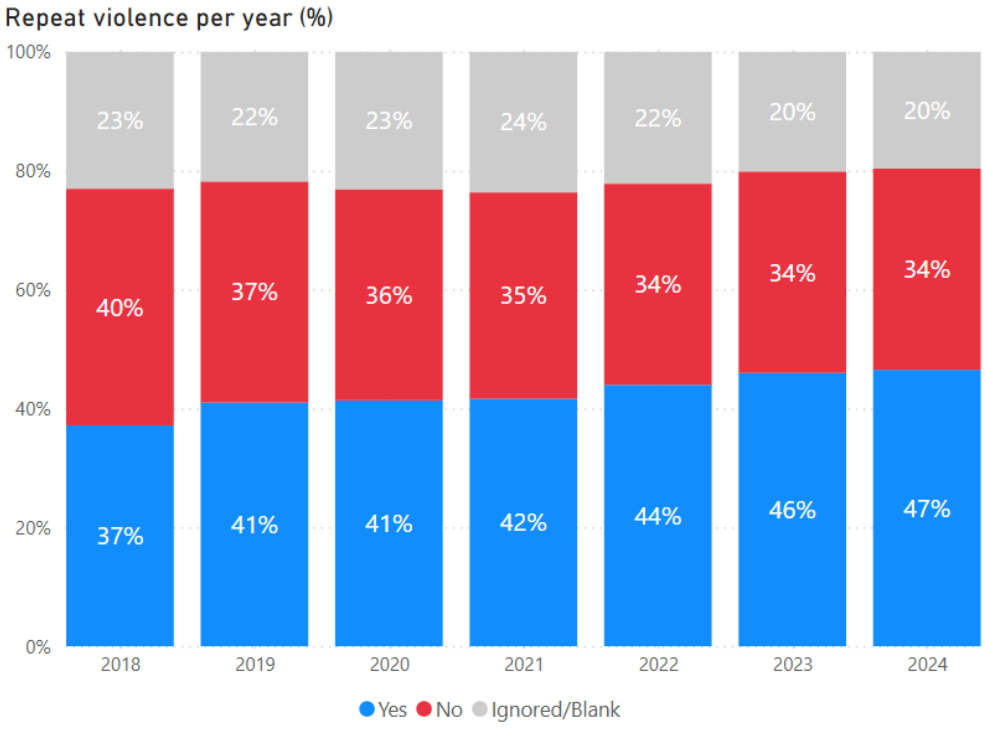


Source: Research Authors (2025).

The means with the highest number of notifications was poisoning/intoxication, corresponding to 66.19% of notifications (234,112), followed by sharp/piercing objects at 18.39% (65,040) and hanging/strangulation at 6.54% (23,141).

Violence was repetitive in 150,277 notifications (42.49%) and non-repetitive in 122,334 (34.58%). In the remaining 81,104 notifications (22.93%), these data were ignored or not informed (Figure 5).

Figure 5. Reports of repeat violence per year.



Source: Research Authors (2025).

3.3 Referral and evolution of the case

Referral to the health sector presented a total of 394,428 notifications during the pandemic classified as blank or ignored, the variable with the highest incidence in this category. The second and third variables were defined as outpatient referral and hospital admission, with 4,117 and 1,169 notifications, respectively.

The case outcome, referring to the follow-up of the individual after the mandatory notification, presented a total of 353,714 classified as blank and 1 outcome classified as hospital discharge, the only variables in this notification field completed during the pandemic period.

3.4 Poisson regression statistical analysis

To better understand the epidemiological data obtained from notifications and identify possible categories with temporal trends, the Poisson regression statistical method with offset=log(annual total) was applied to all data from 2018 to 2024. After this analysis, the data categories presenting the highest statistical significance were detailed (Table 1).

Table 1. Statistical analysis of Poisson regression.

Variable	Category	IRR	IC95%_low	IC95%_up	P value	Dispersion
Race	Mixed-race (Parda)	1.044	1.042	1.046	< 0.001	3.80
Schooling	Complete high school	1.053	1.050	1.055	< 0.001	23.07
Race	Ignored/Blank	0.901	0.898	0.905	< 0.001	160.15
Violence by repetition	Yes	1.034	1.032	1.035	< 0.001	25.90
Schooling	5th to 8th grade incomplete ES	0.947	0.944	0.950	< 0.00003	21.49
Race	White	0.973	0.972	0.975	< 0.00003	14.09
Life cycle	Adolescent	0.968	0.966	0.969	< 0.00006	201.70
Age group	15-19	0.968	0.966	0.970	< 0.001	65.28
Violence by repetition	No	0.976	0.975	0.978	< 0.001	33.10
Violence by repetition	Ignored	0.972	0.970	0.974	< 0.00002	62.15

ES: Elementary School; IRR: Incidence Rate Ratio; CI: Confidence Interval.
Source: Research Authors (2025).

Among data regarding frequency by race per notification year, the statistical analysis indicated a significant increase in the notification rate classified as Mixed-race ("Parda"), with an IRR of 1.044 (95% CI 1.042–1.046); $p < 0.001$. This translates to an estimated average annual increase of 4.4% relative to the total notifications. By the end of the interval in 2024, this corresponds to approximately 29.51% more than in 2018, indicating a possible significant increase in notifications within the Mixed-race population.

Furthermore, in this same category, notifications classified as White race showed a relative annual reduction of 2.69%, totaling 15.11% by the end of the analyzed period, with an IRR of 0.973 (95% CI 0.972–0.975); $p < 0.00001$. Concurrently, notifications classified as blank or ignored for race presented an IRR of 0.901 (95% CI 0.898–0.905); $p < 0.001$, demonstrating a relative annual decrease of 9.88% and 46.43% by the end of the period. Such changes may indicate an improvement in racial classification and a significant shift in the notification profile over time.

Frequency by education per notification year showed a relative increase in notifications attributed to participants with complete high school education, with an IRR of 1.053 (95% CI 1.050–1.055); $p < 0.001$, and an estimated average annual increase of 5.27%, resulting in a 36.09% increase by the end of the analysis period. Conversely, notifications classified as 5th

to 8th grade incomplete elementary education showed a relative annual decrease of 5.31%, totaling a 27.92% decrease by the end of 2024, with an IRR of 0.947 (95% CI 0.944–0.950); $p \approx 3.3e-289$.

Among data obtained related to frequency by age group per notification year, the decrease in notifications classified as 15-19 years of age stands out, presenting an IRR of 0.968 (95% CI 0.966–0.970); $p < 0.001$, and a relative annual decline of 3.21%, totaling a 17.80% decrease by the end of 2024. Similarly, a relative reduction in notifications for adolescents is observed in the frequency by perpetrator life cycle category, with an IRR of 0.968 (95% CI 0.966–0.969); $p \approx 6.57e-248$, and a decrease of 3.22% per year, totaling 17.85% by the period's end.

Event data presenting the highest statistical significance in the Poisson regression analysis were frequency by repetitive violence per notification year, where a decrease in repetitive violence notifications classified as "no repetition" and classified as "ignored" was noted. Notifications classified as "no" presented an IRR of 0.976 (95% CI 0.975–0.978); $p < 0.001$ and an annual reduction of 2.38%, while notifications classified as "ignored" presented an IRR of 0.972 (95% CI 0.970–0.974); $p \approx 2.38e-137$ and an annual decline of 2.77%, totaling a final period decrease of 13.48% and 15.53%, respectively.

Parallelly, there was an increase in frequency by repetitive violence per notification year classified as "yes" (being repetitive violence), with an IRR of 1.034 (95% CI 1.032–1.035); $p < 0.001$ and a relative annual increase of 3.37%, totaling a 22.03% increase by the end of 2024.

To maintain methodological caution, after the Poisson regression statistical analysis on selected data categories, the presence of relevant overdispersion was identified, characterized by the dispersion ratio (deviance/df). In such cases, the observed data variability is greater than the variability considered in the Poisson model, which assumes mean and variance are equal (Gonçalves, 2019). Thus, for well-fitted models, the deviance/df ratio is expected to be approximately 1, with values >1 suggesting overdispersion, indicating the need for model adjustments to avoid underestimating the true variance.

Data regarding frequency by race per notification year presented a dispersion of 3.80 for notifications classified as Mixed-race; 14.09 for White; and 160.15 for notifications classified as ignored or blank. The dispersion found for frequency by education per notification year was 23.07 for those classified as complete high school and 21.49 for those classified as 5th to 8th grade incomplete elementary education. For frequency by age group per notification year and life cycle per notification year, the 15-19 age group presented a dispersion of 65.28, and the life cycle classified as adolescent presented a dispersion of 201.70.

Frequency by repetitive violence per notification year presented a dispersion of 33.10 for violence classified as non-repetitive, 62.15 for violence classified as ignored or blank regarding its repetition, and 25.90 for violence classified as repetitive.

Thus, aiming for methodological and statistical rigor and the faithful detection of data variability, reanalysis of the data using another statistical model was deemed necessary.

3.5 Statistical analysis of Negative Binomial

Due to the pronounced overdispersion found in the data analyzed by Poisson regression, the most significant data categories were reanalyzed via the Negative-Binomial model with offset=log(annual total) to correct for overdispersion.

Table 2. Statistical analysis of Negative Binomial.

Variable	Category	IRR	IC95%_low	IC95%_up	P value
Race	Mixed-race (Parda)	1.045	0.721	1.513	0.817
Schooling	Complete high school	1.050	0.725	1.521	0.795
Race	Ignored/Blank	0.902	0.623	1.307	0.586
Violence by repetition	Yes	1.035	0.715	1.499	0.856
Schooling	5th to 8th grade incomplete ES	0.947	0.654	1.372	0.775
Race	White	0.972	0.671	1.408	0.881
Life cycle	Adolescent	0.972	0.671	1.408	0.882
Age group	15-19	0.971	0.671	1.406	0.877
Violence by repetition	No	0.974	0.673	1.411	0.891
Violence by repetition	Ignored	0.974	0.672	1.410	0.888

ES: Elementary School; IRR: Incidence Rate Ratio; CI: Confidence Interval
Source: Research Authors (2025).

After reanalysis, data relative to frequency by race per notification year classified as Mixed- race ("Parda") presented an IRR of 1.045 (95% CI 0.721–1.513), p = 0.817, indicating an annual increase of 4.47% and 30.00% by the end of 2024. Notifications classified as race ignored or blank presented an IRR of 0.902 (95% CI 0.623–1.307), p = 0.586, showing a significant annual decrease of 9.77% and 46.05% by the end of the analyzed period. Moreover, notifications classified as White presented an annual decrease of 2.78% and a total cumulative decrease of 15.58%, with an IRR of 0.972 (95% CI 0.671–1.408), p = 0.881. The corrected dispersion found for this category was ≈0.00 for White and Mixed-race classifications, and ≈0.02 for the ignored or blank classification.

The frequency by education per notification year category demonstrated an IRR of 0.947 (95% CI 0.654–1.372), p = 0.775, and an annual decrease of 5.26% and total cumulative decrease of 27.68% for notifications classified as 5th to 8th grade incomplete elementary education. Notifications classified as complete high school, on the other hand, presented an annual increase of 5.02%, totaling a 34.17% overall increase, with an IRR of 1.050 (95% CI 0.725– 1.521), p = 0.795. This category presented a dispersion of ≈0.00 after correction.

Data obtained from notifications classified as 15-19 years in the frequency by age group per notification year category presented an IRR of 0.971 (95% CI 0.671–1.406), p = 0.877, showing an annual decrease of 2.89% and 16.12% in total. Similarly, frequency by perpetrator life cycle data classified as adolescent presented an IRR of 0.972 (95% CI 0.671–1.408), p = 0.882, plus an estimated annual decrease of 2.78% and 15.54% by the period's end. The corrected dispersion found for these two categories was ≈0.00 for frequency by age group and 0.01 for frequency by perpetrator life cycle.

Notifications regarding frequency by repetitive violence per notification year classified as non- repetitive presented an IRR of 0.974 (95% CI 0.673–1.411), p = 0.891, and an annual decrease of 2.55%, totaling 14.36% by the end of the six years analyzed. Those classified as ignored, in turn, presented an IRR of 0.974 (95% CI 0.672–1.410), p = 0.888, showing an estimated annual decrease of 2.63% and 14.77 by the end of the analysis. Conversely, notifications classified as a repetitive violence episode presented an IRR of 1.035 (95% CI 0.715–1.499), p = 0.856, demonstrating an annual increase of 3.50% and 22.90% by the end of 2024. The corrected dispersion presented by this category was ≈0.00.

It is concluded, therefore, that after using the negative binomial model to correct the overdispersion presented earlier in the Poisson regression test, the p-value underwent significant alterations, indicating that the analyzed and corrected data fall outside the pre- established confidence intervals for better methodological rigor. This fact highlights potential study limitations, such as the possibility of underreporting, the quality of variable completion in mandatory notification forms, and

the ecological nature of the data preventing individual causal inferences. However, the presented data reinforce the change in important socioeconomic and event-related categories concerning self-inflicted violence and demonstrate the need for improvements and the creation of updated public policies in epidemiology and public health to address such limitations.

4. Discussion

Self-violence is understood as injuries inflicted by an individual upon themselves, often associated with mental disorders, and currently represents a public health problem. Thus, understanding and further discussing this type of violence is fundamental for greater awareness of the issue (Fonseca & Marin, 2022). This study evidenced changes in the variables presented in self-inflicted violence notifications during the analysis period (2018-2024), primarily those related to the epidemiological profile and event data.

The outlined epidemiological profile highlights an increase in mandatory notifications among female individuals, a finding consistent with the increase of the female population in Brazil and the rise of mental disorders among women, as females are more prone to developing these health conditions (Sahoo et al., 2023). This is due to complex biological, psychosocial, and sociocultural factors, such as genetic predisposition, greater sensitivity to stress via the hypothalamic-pituitary-adrenal (HPA) axis, influence of sex hormones, greater exposure to interpersonal trauma, work overload, and economic disadvantage (Santomauro et al., 2021).

The age group of 20-29 years, as well as the life cycle characterized as adult in the performed notifications, show a notable increase, being the variables with the highest total number within their category. These data align with national and global statistics, which present suicide as one of the leading causes of death among young adults, demonstrating the materialization of self-inflicted violence in this population (WHO, 2021; Ministério da Saúde, 2025b). Main reasons related to this fact are developmental factors and the transition to adult life, as this period is characterized by personal and professional instability and socioeconomic pressures (Case & Deaton, 2021). It is noteworthy that this age group encompasses much of the onset of psychological symptoms and development of mental disorders, in addition to the maturation of the prefrontal cortex, which is not yet complete, predisposing individuals to impulsive behaviors and deficient emotional regulation (Gunatilake et al., 2025). Furthermore, with technological advancement, correlations have emerged between increased social media use time and increased depressive symptoms and self-inflicted violence among adolescents and young adults, motivated by social comparison, cyberbullying, and feelings of loneliness and isolation (Barjaková et al., 2023).

Another point raised in the study relates to the location of self-violence occurrence. The location where an individual executes this type of violence can be understood as a factor that enables or facilitates the action. Based on the collected data, the individual's own residence is where most notifications are concentrated, as it is a place of easy access and greater privacy for the individual, with fewer barriers to prevent self-injury (Roza et al., 2023).

Moreover, the predominant means of aggression was poisoning or intoxication. Globally, in countries with higher socioeconomic conditions, the use of widely accessible psychotropic drugs and analgesics is the main cause of hospitalizations related to self-inflicted violence and suicide attempts (Witt et al., 2021). In Brazil, one means of intoxication is through pesticides and agricultural chemicals, demonstrating the need for restrictive measures and proper control over access to these substances (Zanchi et al., 2023).

The absence of ideal completion in the case outcome and referral to the health sector fields may occur due to structural problems in the health area, such as professional overload, where staff prioritize patient care and clinical management over the proper completion and recording of information at the site, due to high workload demands (Leite et al., 2024). Additionally, lack of knowledge about the purpose and importance of epidemiological surveillance and the lack of

integration of referral and counter-referral systems can lead to incorrect completion or absence of this information, generating a break in patient care continuity and difficulties in the epidemiological surveillance of diseases requiring mandatory notification (Lorkowski et al., 2020).

Following the Poisson regression statistical analysis, the presence of relevant alterations in data concerning self-inflicted violence notifications became notable. In the race variable, the increase in mandatory notifications classified as Mixed-race ("Parda") may be attributed to an improvement in personal identification and color/race records and changes in healthcare system access among Mixed-race populations (Ministério da Saúde, 2017; IBGE, 2023). Due to the pandemic period, social and regional inequalities were amplified, leading to greater exposure to stressors in this population, making them more susceptible to self-inflicted violence events, and consequently, leading them to seek health services more frequently (Apolonio et al., 2022). This fact is corroborated by the decrease in notifications classified as White race or as ignored/blank, demonstrating the racial reclassification noted in the statistical analysis, even though the White race presented the highest total number of notifications during the pandemic period.

Data concerning education demonstrate a significant increase in notifications classified as complete high school, as seen earlier during the creation of the epidemiological profile, indicating a possible change in socioeconomic and occupational factors during the COVID-19 pandemic. Furthermore, since 2009, completion of high school education became mandatory, resulting in a greater record of this category (Silva, 2020).

The aforementioned fact assists in shifting the age and educational distribution, possibly being one of the plausible hypotheses for the decrease in notifications classified as 5th to 8th grade incomplete elementary education, in addition to demographic changes and alterations in the search for and proper registration of these individuals. Another possible hypothesis for this decrease could be Goal 2 of Law No. 13.005/2014, which aimed to "universalize 9 (nine) years of elementary education for the entire population aged 6 (six) to 14 (fourteen) years and ensure that at least 95% (ninety-five percent) of students complete this stage at the recommended age, by the last year of validity of this National Education Plan (PNE)" (Brasil, 2014).

Regarding the age group and perpetrator life cycle, the statistical analysis used presented a relative decline in notifications classified as individuals aged 15-19 years and in the life cycle classified as adolescent. This decrease may have been caused by changes in access and detection of this group during the pandemic period, alterations in seeking health services, and school and social changes due to the lockdown period and remote teaching. However, recent studies note a constant increase in self-inflicted violence among adolescents, which may reveal possible underreporting during the analyzed period (Ferreira et al., 2025).

Notifications classified as positive ("yes") for repetitive violence showed a significant increase, as demonstrated in the outlined profile, which may have been evidenced during the COVID-19 pandemic due to a higher incidence of stressor events during this period, since socioeconomic instability, high death rates and complications recorded during the pandemic, and generalized fear may have caused the worsening of mental disorders and the individual's general psychological state, being one of the possible causes for the greater identification of repeated episodes of self-inflicted violence (Bryant et al., 2021).

Concurrently, there was a reduction in notifications classified as negative ("no") and ignored for repetitive violence, indicating a relative transfer between categories and an improvement in identifying repetitive violence cases and their respective completion in mandatory notification forms, in addition to a real reduction in negative ("no") classifications, ignored classifications, and a real increase in positive ("yes") classifications (Orri, 2023).

Thus, it is concluded that the change in variables may have occurred primarily due to concrete changes in the incidence of variables present in self-inflicted violence notifications and in seeking health services, leading to changes in the

epidemiological profile and event data. Moreover, it is important to note that the pandemic period caused significant alterations in mandatory notification rates, not only for self-inflicted violence cases but for various other health conditions. Such facts highlight the need for new research in epidemiology and public health to understand the changes that occurred during this period, the phenomena that led to them, and the possibility of underreporting during the pandemic period, which may lead to a minimization of the effects of real events.

5. Conclusion

The study characterized the epidemiological profile and other relevant variables concerning self-inflicted violence notifications during a critical period for public health, the pandemic caused by the SARS-CoV-2 virus. The epidemiological profile found was: female sex (69.9%), age group 20-29 years (30.0%), adult life cycle (46.4%), White race (43.9%), complete high school education (30.8%), occurring at residence (83.6%), via poisoning/intoxication (66.2%), and being repetitive violence (42.5%). The relevant variables were race (with categories White, Mixed-race, and Ignored/Blank), education (complete high school and 5th-8th grade incomplete elementary education), repetitive violence (yes, no, and ignored), and life cycle (adolescent). These variables presented significance in the Poisson regression statistical analysis but not in the Negative Binomial analysis; nevertheless, they remain relevant.

The conducted analyses highlight the importance of population health notification and monitoring systems, such as SINAN and DataSUS, and emphasize the need for complete and correct completion of mandatory notifications to aid in the control and epidemiological monitoring of these health conditions and contribute to equity in the Brazilian health sector. This is crucial as much data are centralized mainly in regions with higher socioeconomic indices and greater access to health services, and are improperly filled, with much information ignored or left blank.

References

Apolonio, J. S., da Silva Júnior, R. T., Cuzzuol, B. R., Araújo, G. R. L., Marques, H. S., de Souza Barcelos, I., ... & de Melo, F. F. (2022). Syndemic aspects between COVID-19 pandemic and social inequalities. *World journal of methodology*, 12(5), 350. https://doi.org/10.5662/wjm.v12.i5.350.

Barjaková, M., Garnero, A., & d'Hombres, B. (2023). Risk factors for loneliness: A literature review. *Social science & medicine*, 334, 116163. https://doi.org/10.1016/j.socscimed.2023.116163.

Brasil. (2014). *Lei Nº 13.005, de 24 de junho de 2014.* https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2014/lei/l13005.htm.

Bryant, L. D., O'Shea, R., Farley, K., Brennan, C., Crosby, H. F., Guthrie, E., & House, A. (2021). Understanding the functions of repeated self-harm: AQ methodology approach. *Social Science & Medicine*, *268*, 113527. https://doi.org/10.1016/j.socscimed.2020.113527.

Byers, A. L., Allore, H., Gill, T. M., & Peduzzi, P. N. (2003). Application of negative binomial modeling for discrete outcomes: a case study in aging research. *Journal of clinical epidemiology*, 56(6), 559-564. https://doi.org/10.1016/S0895-4356(03)00028-3.

Case, A., & Deaton, A. (2021). Deaths of Despair and the Future of Capitalism. *Princeton University Press*, 336. https://digital.casalini.it/9780691217062.

Costa Neto, P. L. O & Bekman, O. R. (2009). *Análise estatística da decisão*. Editora Blücher.

Ferreira, D. B. B., Santos, R. M. S., Machado, M. C. L., Rezende, V. H. M., Gazire de Marco, P., Romano-Silva, M. A., & Marques de Miranda, D. (2025). Suicidality and self-harm in adolescents before and after the COVID-19 pandemic: a systematic review. *Frontiers in Psychiatry*, 16, 1643145. https://doi.org/10.3389/fpsyt.2025.1643145.

Fonseca, A. C. de S., & Marin, A. H. (2023). Violência Autoprovocada no Brasil: Caracterização dos Casos Notificados entre 2009 e 2021. *Revista Psicologia E Saúde*, *14*(3), 131–146. https://doi.org/10.20435/pssa.v14i3.2005

Gunatilake, N., Boyes, A., Elwyn, R., Brunet, A., Hermens, D. F., & Driver, C. (2025). Adolescent Brain Development Following Early Life Stress: A Systematic Review of White Matter Alterations from Diffusion Tensor Imaging Studies. *Adolescent Research Review*, 1-48. https://doi.org/10.1007/s40894-025-00263-5.

Instituto Brasileiro de Geografia e Estatística (IBGE). (2023). *Panorama do Censo 2022.* https://censo2022.ibge.gov.br/panorama/.

Johnston, J. N., Campbell, D., Caruncho, H. J., Henter, I. D., Ballard, E. D., & Zarate Jr, C. A. (2022). Suicide biomarkers to predict risk, classify diagnostic subtypes, and identify novel therapeutic targets: 5 years of promising research. *International journal of neuropsychopharmacology*, 25(3), 197-214. https://doi.org/10.1093/ijnp/pyab083.

Kirtley, O. J., O'Carroll, R. E., & O'Connor, R. C. (2015). The role of endogenous opioids in non-suicidal self-injurious behavior: methodological challenges. *Neuroscience & Biobehavioral Reviews*, 48, 186-189. https://doi.org/10.1016/j.neubiorev.2014.11.007.

Leite, C. C. F., Sato, T. O., Maia, H. F., & Neto, J. C. (2024). Work overload and associated factors in healthcare professionals during the COVID-19 pandemic. *Journal of healthcare quality research*, *39*(5), 291-298. https://doi.org/10.1016/j.jhqr.2024.05.001.

Lorkowski, J., Maciejowska-Wilcock, I., & Pokorski, M. (2020). Overload of medical documentation: a disincentive for healthcare professionals. *Medical research and innovation*, 1-10. https://doi.org/10.1007/5584_2020_587.

Ministério da Saúde. (2017). *Política Nacional de Saúde Integral da População Negra: uma política para o SUS. 3ª ed.* https://bvsms.saude.gov.br/bvs/publicacoes/politica_nacional_saude_populacao_negra_3d.pdf.

Ministério da Saúde. (2025a). *Violência Interpessoal/Autoprovocada - Brasil.* http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sinannet/cnv/violebr.def.

Ministério da Saúde. (2025b). *Mortalidade - Brasil.* http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sim/cnv/obt10uf.def.

Orri, M., Gifuni, A. J., Ougrin, D., Boruff, J., Cipriani, A., Furukawa, T. A., ... & Cortese, S. (2023). Psychosocial interventions for the prevention of self-harm repetition: protocol for a systematic review and network meta-analysis. *BMJ open*, 13(8), e072289. https://doi.org/10.1136/bmjopen-2023-072289.

Paulo, D. G. (2019). *Modelo de egressão de Poisson Generalizado: análise de dados de contagem com sobredispersão e subdispersão* (Master's thesis, Universidade do Minho (Portugal)).

Pereira, A. S. et al. (2018). *Metodologia da pesquisa científica*. [free ebook]. Santa Maria: Editora da UFSM.

Roza, T. H., Marchionatti, L. E., Gosmann, N. P., do Canto, G. C., Machado, P. V., Massuda, R., ... & Telles, L. E. D. B. (2023). Characteristics of deaths by suicide in postmortem studies in Brazil: A systematic review and meta-analysis. *Suicide and Life-Threatening Behavior*, *53*(6), 1086-1107. https://doi.org/10.1111/sltb.13009.

Sahoo, K. C., Negi, S., Mahapatra, P., Samantaray, K., Dash, G. C., Dubey, S., ... & Pati, S. (2023). Gender dimensions of health-related challenges among urban poor during COVID-19 pandemic in low-and middle-income countries: a systematic review and gap analysis. *Frontiers in public health*, 11, 1170386. https://doi.org/10.3389/fpubh.2023.1170386.

Santomauro, D. F., Herrera, A. M. M., Shadid, J., Zheng, P., Ashbaugh, C., Pigott, D. M., ... & Ferrari, A. J. (2021). Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *The Lancet*, 398(10312), 1700-1712. https://doi.org/10.1016/S0140-6736(21)02143-7.

Santos, O. V., Silva, L. A. M. L. D., Okuno, M. F. P., Hino, P., Martínez-Riera, J. R., & Fernandes, H. (2024). Self-harm in the two years of greatest restrictions during the covid-19 pandemic: a cross-sectional study. *Revista Brasileira de Enfermagem*, 77(Suppl 2), e20240289. https://doi.org/10.1590/0034-7167-2024-0289.

Shitsuka, R. et al. (2014). *Matemática fundamental para tecnologia*. (2nd Ed.). Editora Érica.

Silva, M. R. D. (2020). Ampliação da obrigatoriedade escolar no Brasil: o que aconteceu com o Ensino Médio?. *Ensaio: avaliação e políticas públicas em educação*, 28(107), 274-291. https://doi.org/10.1590/S0104-40362019002701953.

Vieira, S. (2021). *Introdução à bioestatística*. Editora GEN/Guanabara Koogan.

WHO. (2002). *World report on violence and health.* https://iris.who.int/bitstream/handle/10665/67403/a77019.pdf.

WHO. (2021). *Mental Health, Brain Health and Substance Use*. https://www.who.int/teams/mental-health-and-substance-use/data-research/suicide-data.

WHO. (2022). *Training manual for surveillance of suicide and self-harm in communities via key informants*. https://iris.who.int/bitstream/handle/10665/365481/9789240065628-eng.pdf.

Witt, K. G., Hetrick, S. E., Rajaram, G., Hazell, P., Salisbury, T. L. T., Townsend, E., & Hawton, K. (2021). Psychosocial interventions for self-harm in adults. *Cochrane database of systematic reviews*, (4). https://doi.org/10.1002/14651858.CD013668.pub2.

Zanchi, M. M., Marins, K., & Zamoner, A. (2023). Could pesticide exposure be implicated in the high incidence rates of depression, anxiety and suicide in farmers? A systematic review. *Environmental pollution*, *331*, 121888. https://doi.org/10.1016/j.envpol.2023.121888.