**Causes of death from mental and behavioral disorders in Brazil: a cross-sectional and ecological study with an analytical approach in the series from 2011 to 2020**


## Abstract

Mental and behavioral disorders are an important public health problem ~~as a preventable cause~~ in a developing country with great social inequality. The objective of this study was to investigate the causes of death due to mental and behavioral disorders in Brazil from 2011 to 2020 and to analyze the trend of the mortality indicator. It is a cross-sectional and ecological research, with an analytical approach, with public health surveillance data in Brazil. The study analyzed 135,379 deaths from mental and behavioral disorders in Brazil from 2011 to 2020. In the mortality rate, the federation units with the highest rates were Sergipe with 135/100,000 ~~thousand~~ inhabitants, followed by Minas Gerais 110/100,000 ~~thousand~~, Ceará 97 /100,000 ~~thousand~~, and Paraná 74/100,000 ~~thousand~~. There was a 38% increase in the difference between years, the adherence test was significant 0.0001. (The chi-square test was significant by 0.0001, so the male gender is associated with deaths, as well as the young adult age group from 20 to 59, however between 60 and 69 males presented 79% when compared to females, similar to the male gender, is associated with the use of alcohol, multiple drugs, and other psychoactive substances, with the use of cocaine and with the use of tobacco, and with female unspecified dementia, depressive episodes, and vascular dementia.) The above sentence is not clear - reframe the above sentence. As Brazil is a developing country with great social inequalities, it was to be expected that this cause would be so important in the country. However, public policies should be directed mainly towards the reduction of preventable causes, reducing public spending, and improving the quality of life of the population.



**Keywords:** Mental and behavioral disorders; Deaths; Brazil; Trend; Mortality; Risk factor.




## INTRODUCTION

Mental and behavioral disorders represent a public health problem with relevant economic and social impacts, responsible for a greater demand for health services, in addition to causing a decrease in productivity [1].

There are several mental disorders, with different presentations. They are usually characterized by a combination of abnormal thoughts, perceptions, emotions, and behavior, which can also affect relationships with other people. Mental disorders include depression, bipolar affective disorder, schizophrenia and other psychoses, dementia, intellectual disability, and developmental disorders including autism. There are effective strategies for preventing mental disorders such as depression. There are effective treatments for mental disorders and ways to ease the suffering caused by them. Access to health care and social services capable of providing treatment and social support is essential. The burden of mental disorders continues to grow, with significant health impacts and major social, human rights, and economic consequences in all countries of the world [2].

Death surveillance in Brazil is carried out by notifying the death certificate, which is a mandatory official document for the legal procedures of death, therefore, it is necessary for the issuance of other documents for the legalization of death. The classification of causes of death has used the causes of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) and determines the classification and coding of diseases and a wide variety of signs, symptoms, abnormal findings, reports, circumstances social and external causes of harm and/or illness. Death certificate information is registered on the Mortality Information System (SIM) platform [3].

Surveillance has its indicators to assess the quality of the data, such as the control of the distribution of death certificates based on the code of each one, released by the system, and with that, the municipalities have a period for entering the SIM in up to 60 days. As well as, surveillance prioritizes some deaths with immediate investigation, maternal deaths, ~~of~~ women of childbearing age, infant, fetal and ill-defined causes, and the proposition of prevention and control measures [4 ].

Mental and behavioral disorders are preventable causes, and public policies in Brazil already work concerning the prevention and monitoring of patients. The Psychosocial Care Network (RAPS) built the Psychosocial Care Center (CAPS), which are open and community health service aimed at assisting people with psychological distress or mental disorders, including those with needs arising from alcohol use, crack, and other substances, who are in crises or psychosocial rehabilitation processes. Multiprofessional teams work in the establishments, employing different interventions and reception strategies, such as psychotherapy, clinical follow-up in psychiatry,

occupational therapy, neuropsychological rehabilitation, therapeutic workshops, assisted medication, and family and home care, among others [5 ].

The CAPS consists of the following modalities: Caps I: Assistance to all age groups, for serious and persistent mental disorders, including the use of psychoactive substances; serves cities and/or regions with at least 15,000 inhabitants. CAPS II: Care for all age groups, for serious and persistent mental disorders, including psychoactive substance use; serves cities and/or regions with at least 70,000 inhabitants. CAPS I: Assistance to children and adolescents, with severe and persistent mental disorders, including the use of psychoactive substances; serves cities and/or regions with at least 70,000 inhabitants. CAPSAD: Alcohol and Drugs: Assistance to all age groups, specializing in disorders due to the use of alcohol and other drugs, serving cities and/or regions with at least 70,000 inhabitants. CAPS III: Service with up to 5 places for night care and observation; all age groups; severe and persistent mental disorders including the use of psychoactive substances; serves cities and/or regions with at least 150,000 inhabitants. CAPS AD III: Alcohol and Drugs: Service with 8 to 12 vacancies for night care and observation; 24-hour operation; all age groups; disorders due to the use of alcohol and other drugs; serves cities and/or regions with at least 150,000 inhabitants. CAPS AD IV: Care for people with serious conditions and intense suffering resulting from the use of crack, alcohol, and other drugs. Its implementation must be planned along with scenes of use in municipalities with more than 500,000 inhabitants and state capitals, to maximize assistance to this portion of the population. It aims to serve people of all age groups; provide continuous care services, operating 24 hours a day, including holidays and weekends; and offer assistance to urgencies and emergencies, with observation beds [6].

The purpose of the CAPS is to assist people with severe and persistent mental disorders and their families. The CAPS professional team is qualified to provide psychosocial care, seeking to preserve the person's citizenship, treatment in the territory, and social ties [7].

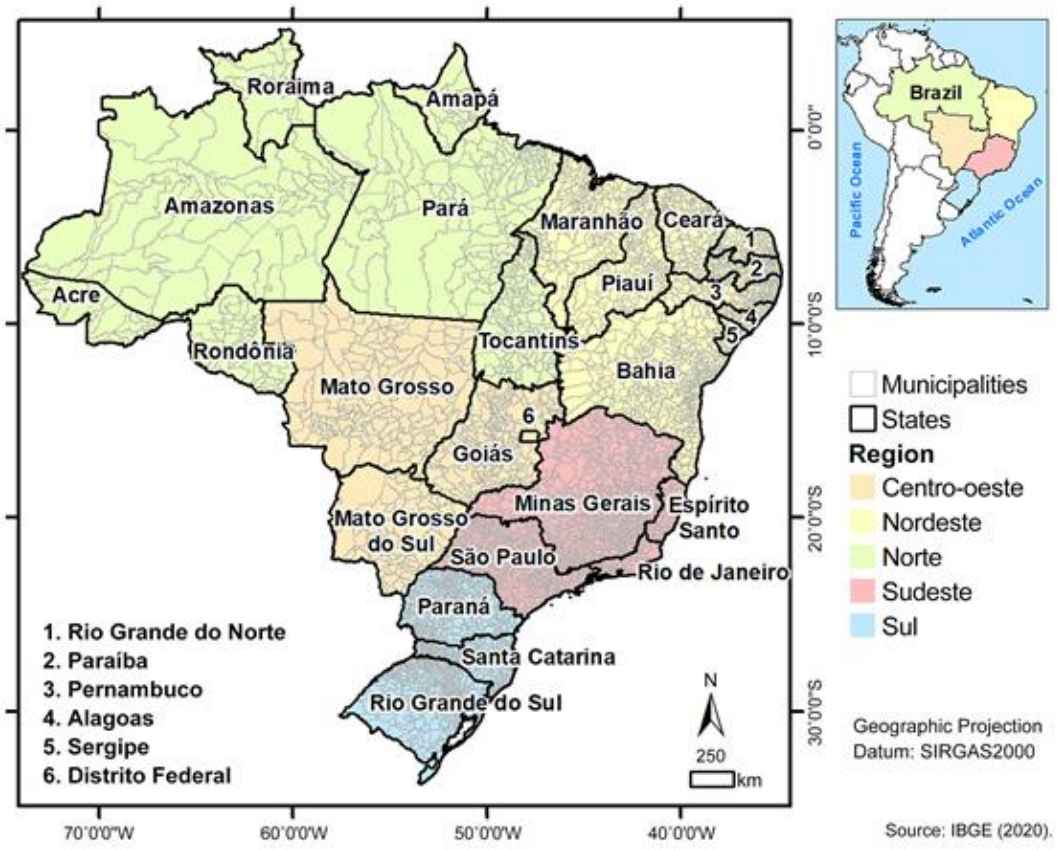
Thus, the objective of this research is to investigate the causes of death due to mental and behavioral disorders in Brazil from 2011 to 2020 and to analyze the trend of the mortality indicator.

## METHOD

A cross-sectional, ecological study with an analytical approach, with data from epidemiological surveillance in Brazil, and secondary data from the Mortality Information System (SIM), which are universally available and publicly accessible through the Department of Informatics of the Unified System of Health of Brazil (DATASUS), which issues aggregated epidemiological surveillance data.

The study location is Brazil, a country, officially the Federative Republic of Brazil, is the largest country in South America and the Latin American region, being the fifth largest in the world in terms of land area (equivalent to 47.3% of the territory South America), with 8,510,417.771 km², and the sixth in population (with more than 207.8 million inhabitants). It is the only country in America where Portuguese is mostly spoken and the largest Portuguese-speaking country on the planet, in addition to being one of the most multicultural and ethnically diverse nations, as a result of strong immigration from various parts of the world. Its current Constitution, enacted in 1988, conceives Brazil as a presidential federative republic, formed by the union of the 26 states, the Federal District, and 5,570 municipalities. The large territorial extension of Brazil covers different ecosystems, such as the Amazon Forest, recognized as having the greatest biological diversity in the world. Amazonian rivers provide a variety of habitats, including swamps and streams, each harboring different types of wildlife. The Atlantic forest and the cerrado also support great biodiversity, in addition to the caatinga, making Brazil a diverse country. In the South, the Araucaria forest grows under temperate climate conditions, therefore, it has a diversity of people with vulnerabilities in different places around the world, such as health, economic and social disparities (figure 1) [8 ].

**Figure 1** – Brazil and its divisions by regions and federation unit.




Source: Sardine 2021 [9].

We included in the study all deaths with ICD-10 due to mental and behavioral disorders, which are from F00 to F99. We included all age groups and gender. The data collection instrument was the data from the death certificate. We collected data by year, sex, age group, and ICD-10.

For data analysis, we performed a choropleth map by federation unit with the accumulated mortality rate in the research period, from 2011 to 2020. The calculation of the mortality rate is performed by the total number of deaths and divided by the total population of the year, multiplied by 100,000 thousand. We built the choropleth map with warm colors in Excel 2019.

We present a table with the absolute number of deaths by year and federation unit and we present the relative accumulated number by federation unit. We carried out an analysis of the mortality trend per year, based on the $R^{2}$ equation and the adherence test, which we presented in a graph. We applied the chi-square test by sex and age group in the absolute numbers of deaths, to investigate whether gender and age group are associated, which we present in a table. We also performed the chi-square test by sex

and ICD-10 cause of death, to investigate whether the cause is associated with sex. All statistical analyzes were performed using the Statistical Package for the Social Sciences, 25.0 (SPSS). The alpha level of significance was equal to or less than 0.05.

The study dispensed with the need for an ethical opinion because as it is public and universal data, Brazilian policies determine the waiver of analysis by an Ethics and Research Committee (CEP).

**RESULTS**

The study analyzed 135,379 deaths from mental and behavioral disorders in Brazil from 2011 to 2020. In the mortality rate, the federation units with the highest rates were Sergipe with 135/100,000 ~~thousand~~ inhabitants, followed by Minas Gerais 110/100 thousand, Ceará 97 /100,000 ~~thousand~~, and Paraná 74/100,000 ~~thousand~~ (figure 2).

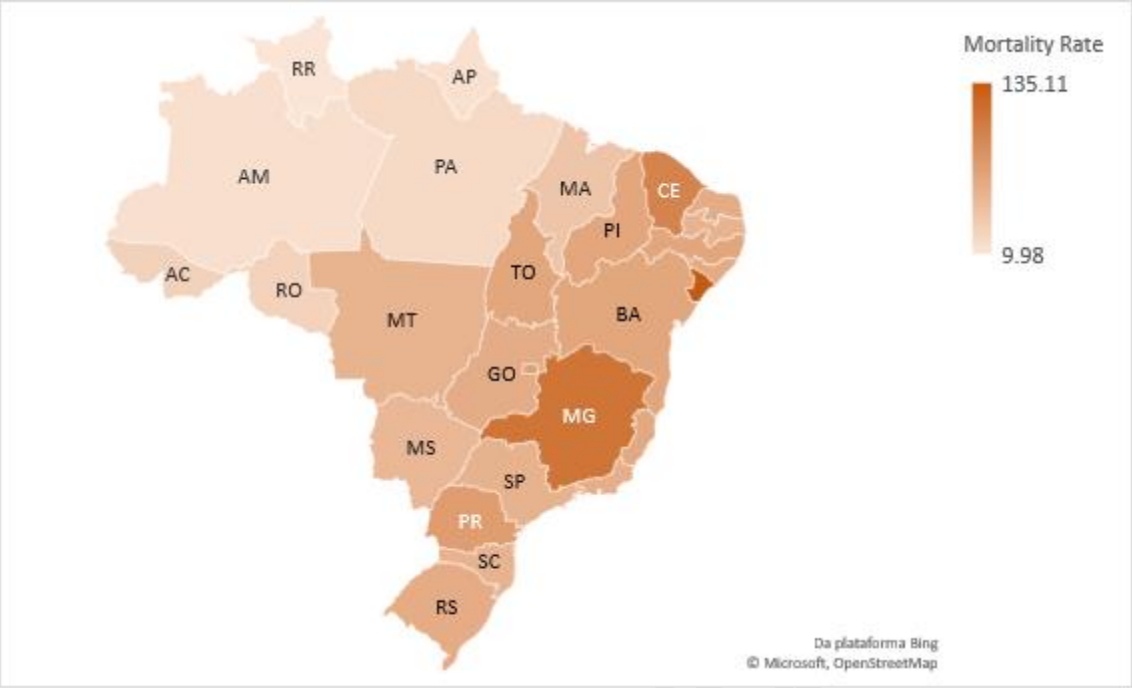
In Table 2 we show that in absolute and relative numbers, the federation units of São Paulo 18.95%, and Minas Gerais 17.38%, justify the largest populations in these places.

In the temporal trend by mortality rate per year, the $R^2$ showed a weak difference of 38% increase in the difference between the years, however, the adherence test was significant at 0.0001, that is, there are differences for the proportions of mortality rate per year, therefore, there is a change in the epidemiological pattern of growth in deaths from mental and behavioral disorders in Brazil from 2011 to 2020 (figure 3).

In the analysis by sex and age group, the chi-square test was significant at 0.0001, thus the male gender is associated with deaths, (as well as the young adult age group from 20 to 59, however, between 60 and 69 males presented 79% when compared to females) (Table 2). - above sentence is not clear - reframe the above sentence

When we compare sex by causes per ICD-10, the chi-square test was significant at 0.0001, so there is a difference by sex in the causes of death, the male gender is associated due to the use of alcohol, multiple drugs, and other substances psychoactive, due to cocaine use and due to tobacco use, and female unspecified dementia, depressive episodes, and vascular dementia (Table 3).

**Figure 2** – Cumulative mortality rate for deaths from Mental and Behavioral Disorders in Brazil from 2011 to 2020.



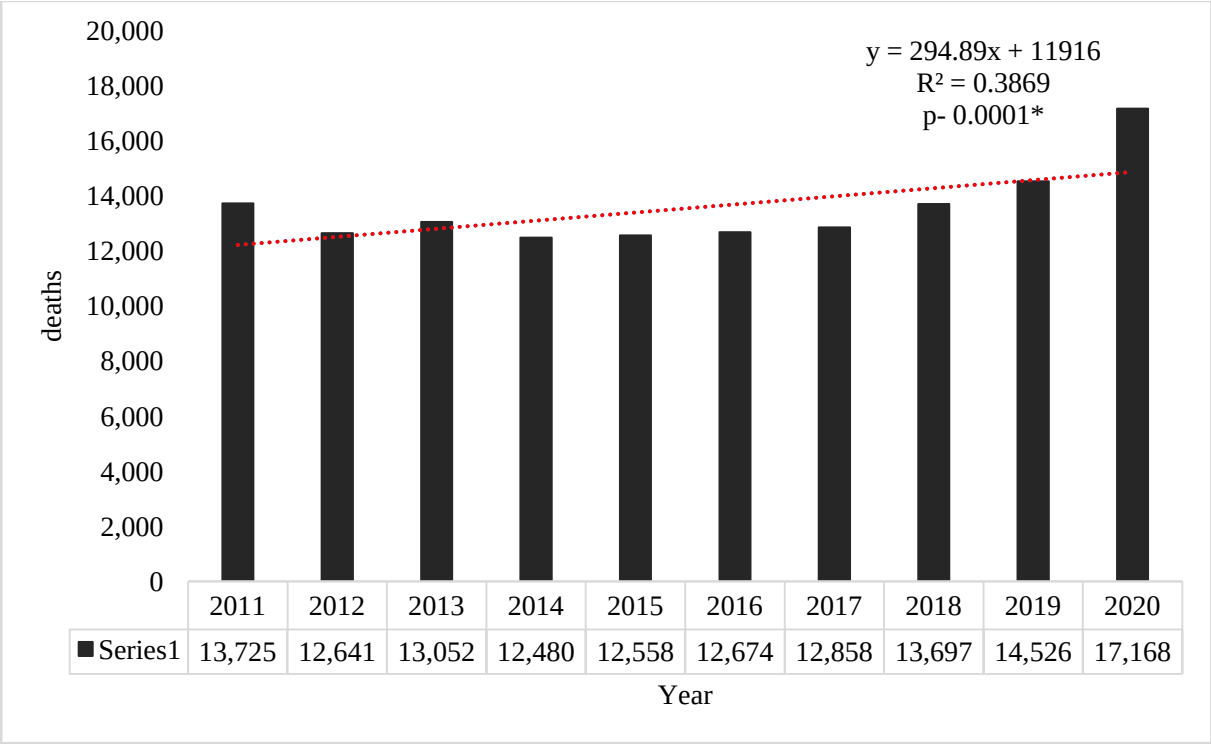

Source: MS/SVS/CGIAE - Mortality Information System – SIM.

**Table 1** – Number of cases of deaths due to mental and behavioral disorders by year and by state in Brazil from 2011 to 2020.

| state | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rondônia | 39 | 28 | 44 | 45 | 54 | 44 | 60 | 44 | 59 | 62 | 479 | 0.35 |
| Acre | 26 | 19 | 20 | 25 | 33 | 27 | 29 | 26 | 19 | 21 | 245 | 0.18 |
| Amazon | 57 | 49 | 68 | 63 | 64 | 48 | 61 | 64 | 54 | 94 | 622 | 0.46 |
| Roraima | two | 6 | two | two | 6 | 11 | 8 | 8 | 8 | 10 | 63 | 0.05 |
| For | 150 | 128 | 146 | 166 | 180 | 179 | 187 | 160 | 195 | 275 | 1,766 | 1.30 |
| Amapá | 13 | 9 | 7 | 6 | 10 | 14 | 8 | 10 | 18 | 32 | 127 | 0.09 |
| Tocantins | 99 | 97 | 99 | 110 | 103 | 103 | 112 | 95 | 93 | 136 | 1.047 | 0.77 |
| Maranhao | 255 | 164 | 211 | 256 | 281 | 285 | 268 | 309 | 336 | 391 | 2,756 | 2.04 |
| Piauí | 204 | 212 | 208 | 188 | 216 | 200 | 218 | 253 | 217 | 265 | 2,181 | 1.61 |
| Ceará | 1.104 | 968 | 1,067 | 933 | 971 | 694 | 726 | 736 | 806 | 909 | 8,914 | 6.58 |
| Rio Grande do Norte | 213 | 207 | 219 | 197 | 227 | 199 | 194 | 200 | 218 | 262 | 2.136 | 1.58 |
| Paraíba | 227 | 212 | 221 | 170 | 201 | 227 | 227 | 213 | 240 | 287 | 2.225 | 1.64 |
| Pernambuco | 504 | 566 | 603 | 552 | 500 | 609 | 606 | 567 | 614 | 1.255 | 6,376 | 4.71 |
| Alagoas | 175 | 192 | 174 | 185 | 206 | 251 | 226 | 187 | 220 | 266 | 2,082 | 1.54 |
| sergipe | 241 | 258 | 361 | 308 | 310 | 316 | 342 | 307 | 327 | 363 | 3.133 | 2.31 |
| bahia | 983 | 818 | 960 | 915 | 1.004 | 905 | 924 | 961 | 1.052 | 1,347 | 9,869 | 7.29 |
| Minas Gerais | 2,181 | 2,232 | 2,070 | 2.071 | 2,097 | 2,288 | 2,341 | 2,528 | 2,855 | 2,861 | 23,524 | 17.38 |
| Espírito Santo | 299 | 292 | 303 | 294 | 258 | 275 | 229 | 202 | 182 | 267 | 2,601 | 1.92 |
| Rio de Janeiro | 1.128 | 1,130 | 1,183 | 821 | 785 | 886 | 953 | 1.038 | 1.085 | 1.159 | 10.168 | 7.51 |
| São Paulo | 2,761 | 2,389 | 2,319 | 2,500 | 2,435 | 2,437 | 2,284 | 2,492 | 2,733 | 3,300 | 25,650 | 18.95 |
| Paraná | 904 | 769 | 852 | 787 | 791 | 821 | 752 | 905 | 912 | 1,084 | 8,577 | 6.34 |
| Santa Catarina | 411 | 328 | 337 | 376 | 393 | 379 | 387 | 513 | 454 | 393 | 3,971 | 2.93 |
| Rio Grande do Sul | 813 | 665 | 670 | 581 | 546 | 599 | 694 | 760 | 774 | 918 | 7.020 | 5.19 |
| Mato Grosso do Sul | 177 | 162 | 155 | 138 | 135 | 131 | 123 | 191 | 116 | 90 | 1,418 | 1.05 |
| Mato Grosso | 193 | 179 | 183 | 213 | 185 | 176 | 206 | 168 | 212 | 227 | 1942 | 1.43 |
| Goias | 399 | 414 | 417 | 436 | 401 | 361 | 395 | 441 | 426 | 581 | 4.271 | 3.15 |
| Distrito Federal | 167 | 148 | 153 | 142 | 166 | 209 | 298 | 319 | 301 | 313 | 2,216 | 1.64 |
| **Total** | **13,725** | **12,641** | **13.052** | **12,480** | **12,558** | **12,674** | **12,858** | **13,697** | **14,526** | **17,168** | **135,379** | **100.00** |

MS/SVS/CGIAE - Mortality Information System – SIM.

**Figure 3** – Trend in mortality from mental and behavioral disorders, in Brazil from 2011 to 2020.




Source: MS/SVS/CGIAE - Mortality Information System – SIM. * Adherence test.

**Table 2** – Deaths from mental and behavioral disorders by age group and sex, in Brazil from 2011 to 2020.

| Age Group | ~~Masculine~~ Male | % | ~~Feminine~~ Female | % | ignored | % | Total | p-value |
|---|---|---|---|---|---|---|---|---|
| **< 1 year** | 11 | 68.75 | 5 | 31.25 | 0 | 0.00 | 16 | |
| 1 to 4 years | 23 | 54.76 | 19 | 45.24 | 0 | 0.00 | 42 | |
| 5 to 9 years | 26 | 53.06 | 23 | 46.94 | 0 | 0.00 | 49 | |
| 10 to 14 years | 60 | 48.78 | 63 | 51.22 | 0 | 0.00 | 123 | |
| 15 to 19 years old | 509 | 71.89 | 199 | 28.11 | 0 | 0.00 | 708 | |
| 20 to 29 years | 3,291 | 80.78 | 783 | 19.22 | 0 | 0.00 | 4.074 | |
| 30 to 39 years | 10,752 | 83.36 | 2.146 | 16.64 | 1 | 0.01 | 12,899 | <0.0001* |
| 40 to 49 years old | 19,854 | 84.54 | 3,630 | 15.46 | 2 | 0.01 | 23,486 | |
| 50 to 59 years old | 22,959 | 83.90 | 4,402 | 16.09 | 3 | 0.01 | 27,364 | |
| 60 to 69 years | 16.111 | 79.79 | 4.075 | 20.18 | 5 | 0.02 | 20.191 | |
| 70 to 79 years old | 10.112 | 66.06 | 5.195 | 33.94 | 1 | 0.01 | 15,308 | |
| 80 > | 12,449 | 40.27 | 18,456 | 59.70 | 8 | 0.03 | 30.913 | |
| ignored | 176 | 85.44 | 21 | 10.19 | 9 | 4.37 | 206 | |
| **Total** | **96,333** | **71.16** | **39.017** | **28.82** | **29** | **0.02** | **135,379** | |

Source: MS/SVS/CGIAE - Mortality Information System – SIM. *Chi-square test.

What is meant by ignored in table 2

**Table 3** – Deaths due to mental and behavioral disorders by ICD-10 category and gender, in Brazil from 2011 to 2020.

| ICD-10 Category | ~~Masculine~~Male | % | ~~Feminine~~Female | % | ignored | % | Total | % | p-value |
|---|---|---|---|---|---|---|---|---|---|
| F10 Due to alcohol use | 61,451 | 90.14 | 6,707 | 9.84 | 14 | 0.02 | 68.172 | 50.36 | |
| F03 Unspecified Dementia | 9.114 | 36.52 | 15,836 | 63.45 | 8 | 0.03 | 24,958 | 18.44 | |
| F17 Due to tobacco use | 11,390 | 70.29 | 4.812 | 29.70 | 2 | 0.01 | 16.204 | 11.97 | |
| F20 Schizophrenia | 2,996 | 58.65 | 2.111 | 41.33 | 1 | 0.02 | 5.108 | 3.77 | |
| F32 Depressive episodes | 1,925 | 39.99 | 2,888 | 59.99 | 1 | 0.02 | 4,814 | 3.56 | |
| F19 Multiple Drugs and other psychoactive substances | 2,741 | 81.14 | 637 | 18.86 | 0 | 0.00 | 3,378 | 2.50 | <0.0001 |
| F01 Vascular dementia | 1,308 | 41.60 | 1,835 | 58.37 | 1 | 0.03 | 3,144 | 2.32 | |
| F99 Not specified elsewhere | 982 | 54.77 | 811 | 45.23 | 0 | 0.00 | 1,793 | 1.32 | |
| F14 Due to cocaine use | 1,266 | 79.92 | 318 | 20.08 | 0 | 0.00 | 1,584 | 1.17 | |
| Other causes | 3,160 | 50.77 | 3.062 | 49.20 | 2 | 0.03 | 6,224 | 4.60 | |
| Total | 96,333 | 100 | 39.017 | 100 | 29 | 100 | 135,379 | 100 | |

Source: MS/SVS/CGIAE - Mortality Information System – SIM. *Chi-square test.

What is meant by ignored in table 3

## DISCUSSION

This ecological study of the causes of death from mental and behavioral disorders in Brazil from 2011 to 2020 showed that the trend is increasing over the years and that the male gender is a factor associated with deaths, as well as causes such as alcohol use and drugs predominate in men, while in women the causes of dementia and depression predominate.

Law nº 11.343/2006, which governs public policy in Brazil on drugs, establishes as one of the principles of prevention "the strengthening of autonomy and individual responsibility" and also advocates "non-use" or "delay in use". and risk reduction as the desired objectives for preventive actions. With the recent changes brought about by Law nº 13.840/201923, however, the system no longer assumes the perspective of harm reduction, adopting abstinence as the only approach to drug use. It is stipulated that there be the implementation of prevention programs in public and private education institutions and, for that, professionals of the three levels of education must receive training through continuing education policies. Research, however, shows that teachers are unprepared to perform this function due to fear, lack of information, or lack of ability to approach the subject [10].

More recently, the Interministerial Decree n. 2, of December 21, 2017, created the Interministerial Management Committee intending to coordinate prevention, research,

care, training, and social reintegration actions within the scope of the federal government, originally composed of the Ministries of Justice, Labor, Health and Social and Agrarian Development. Finally, in 2019, Decree n. 9,761/2019, which regulates the National Drug Policy, currently in force, promoting adjustments in the Governance of the National Drug Policy [11].

One study concludes that to be effective in combating drug use and trafficking, it is essential to know who is the cause and who is the consequence. Because despite the violence present in the production chain of these psychoactive substances, the influence of social factors is often forgotten, such as poverty, unemployment, corruption, and hunger, which are living portraits of our day-to-day life, so often disorient our actions [12].

According to a study, carried out with 131 crack users over 5 years and examined patterns of mortality as well as causes of death among them. After 5 years, 124 patients were located (95%). At the endpoint of the study (1999), 23 patients (17.6%) had died. Homicide was the most prevalent cause of death (n = 13). Nearly a third of deaths were due to HIV infection, especially among those with a history of intravenous drug use. Less than 10% died from an overdose. The study suggests that the risk of mortality among crack users is higher than in the general population [13].

In another study, they evaluated the frequency of alcohol and drug use in Brazilian university students and highlighted that men were more likely to use and engage in the dangerous use of anabolic androgenic steroids than women in all age groups. On the other hand, women over 34 years of age were more likely to use and engage in dangerous amphetamine use. These findings are consistent with the results reported for the general Brazilian population. Therefore, these findings should be taken into account when developing strategies to prevent drug use and early identification of drug abuse among college students [14].

A systematic review evaluated the use of alcohol and drugs in Brazilian adolescents and highlighted the prevalence of current alcohol use ranging from 23.0% to 67.7%. The mean prevalence was 34.9%. The prevalence of current tobacco use ranged from 2.4% to 22.0%, with a mean prevalence of 9.3%. Most of the studies estimated prevalences of frequent alcohol use (66.7%) and heavy alcohol use (36.8%) above 10%. However, most studies found prevalences of frequent and heavy tobacco use below 10%. Environmental factors (religiousness, working conditions, and substance use among family and friends) and psychosocial factors (such as conflicts with parents and feelings of negativity and loneliness) are associated with tobacco and alcohol use among adolescents.

The results suggest that alcohol and tobacco consumption among adolescents has reached alarming prevalence rates in different locations in Brazil. As unhealthy behaviors tend to persist from adolescence to adulthood, public policies aimed at reducing the use of alcohol and tobacco among Brazilians in the medium and long term may target young people and the subgroups most at risk for such behaviors [ 15].

A survey analyzed hospitalizations for mental and behavioral disorders in the elderly in Brazil and highlighted 139,941 hospitalizations and 2,962 deaths, the rate of hospitalization for mental and behavioral disorders decreased in Brazil, from 122.3 to 84.2 per 100,000 inhabitants (- 0.14%; 95%CI -0.25;-0.03), and its macro-regions, except for the South, which showed a stationary trend (0.08%;95%CI -0.11;0.27); hospital mortality rates in Brazil, in 2008 and 2014, were, respectively, 1.73 and 2.38 per 100,000 inhabitants; dementia was the main diagnosis in hospitalizations that registered deaths (32.3%). However, they concluded that despite the reduction in the coefficient of hospitalization for mental and behavioral disorders in the studied period, the hospital mortality rate increased [16] This is similar to our study about the increase in deaths, however in the study, they were limited to the elderly and death in the hospital environment.

A study analyzed depressive symptoms as a risk factor for death in a municipality in southern Brazil and highlighted the prevalence of depressive symptoms as 23.5% (95%CI 20.4-26.9). In the crude analysis, the mortality risk was 1.86 (95%CI 1.35-2.55) for individuals with depressive symptoms; in adjusted models, the risk of mortality was 1.67 (95%CI 1.15-2.40). Depressive symptoms are an independent risk factor for mortality in elderly Brazilians. These findings highlight the importance of screening this population for depression and the practice of preventive actions [17].

A survey of the Global Burden of Disease Study 2017 (GBD-2017) for depressive disorders in Brazil and its Federated Units ( FUs ) in 1990 and 2017. It highlighted that the prevalence of depressive disorders in Brazil was 3.30% (95% interval uncertainty [UI]: 3.08 to 3.57), ranging from 3.79% (3.53 to 4.09) in Santa Catarina to 2.78% in Pará (2.56 to 3.03), with significant differences between the Federated Units. From 1990 to 2017, there was an increase in the number of years lived with disability (55.19%, 49.57 to 60.73), but a decrease in age-standardized rates (−9.01%, −11.66 to − 6.31). The highest proportion of years lived with a disability was observed in the age group of 15 to 64 years and females. The ratio of years lived with observed/expected disability ranged from 0.81 in

Pará to 1.16 in Santa Catarina. Morbidity from depressive disorders was not associated with the sociodemographic index [18].

Depression in women is associated with social deprivation and violence. Research has concluded that depression is common during pregnancy and is associated with indicators of socioeconomic deprivation, violence, and loss of an intimate relationship, in addition to a previous history of depression. Psychosocial interventions and appropriate social policies need to be implemented in this population to reduce the burden of maternal depression [19].

On dementias, a study was carried out in Catanduva, Brazil. The main clinical diagnoses were Alzheimer's disease (AD; 55.1%), vascular dementia (9.3%), and AD with cerebrovascular disease (14.4%). Prevalence increased with age and was higher in women. There was an inverse association with education (3.5% among those with 8 years or more of study to 12.2% among illiterates). The prevalence of dementia in this Brazilian population was 7.1%, with AD being the most frequent diagnosis. Age, female gender, and low education were significantly associated with a higher prevalence of dementia [20].

In this study, the main limitation was the lack of similar studies to discuss our results, studies need to be carried out on the subject to strengthen epidemiological analyzes on the subject, and public policies, to be effective, need to be planned according to scientific evidence. on the indicators, but the low scientific production on the subject is a fragility.

Another limitation is analyzing secondary epidemiological data, there is a risk of bias, although death surveillance and completion of the death certificate are mandatory, training of physicians is essential for data quality. We also highlight that in the states with the highest numbers, despite the larger population, the vigilance and quality of professionals are higher than in other regions of Brazil. Thus, there are several weaknesses in analyzing the causes of death in Brazil, as several factors interfere with the quality of data.



## CONCLUSION

Our study highlighted that the highest mortality rates were in Sergipe, followed by Minas Gerais and Paraná. We showed that in the analyzed series, the trend of deaths due to mental and behavioral disorders is increasing. (Males and young adults are associated with death.) above sentence is not clear - reframe the above sentence Regarding the ~~male~~

causes among men, ~~, due to~~ the use of alcohol, multiple drugs, and other psychoactive substances, ~~due to~~ the use of cocaine and ~~due to~~ tobacco use, and among women ~~female~~ unspecified dementia, depressive episodes, and vascular dementia were associated with increase risk of death.

Public health and public safety policies must be strengthened in Brazil to reduce deaths from mental and behavioral disorders. ~~, a~~Although the cause is social, ~~and that~~ it impacts health. As Brazil is a developing country with great social inequalities, it was to be expected that this cause would be so important in the country. However, public policies should be directed mainly towards the reduction of preventable causes, reducing public spending, and improving the quality of life of the population.

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