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Alana Castro Panzenhagen, Augusto Cezar Sartori Maffini, Raul Dantas, Ken Shimomura, Maria Letícia Rodrigues Ikeda, Daniel Pens Gelain, Flávio Milman Shansis, José Cláudio Fonseca Moreira

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Increased use of psychiatric drugs in Brazil over the years: evidence from a country-wide dataset

Alana Castro Panzenhagen[1], Augusto Cezar Sartori Maffini[2], Raul Dantas[3], Ken Shimomura[4], Maria Letícia Rodrigues Ikeda[5], Daniel Pens Gelain[1], Flávio Milman Shansis[3], José Cláudio Fonseca Moreira[1]

[1]Programa de Pós-Graduação em Ciências Biológicas – Bioquímica, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil.
[2]Curso de Medicina, Universidade do Vale do Taquari (Univates), Lajeado, RS, Brazil.
[3]Programa de Pós-Graduação em Ciências Médicas, Universidade do Vale do Taquari (Univates), Lajeado, RS, Brazil.
[4]Departamento de Bioquímica, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil.
[5]Programa de Pós-Graduação em Saúde Coletiva, Universidade do Vale dos Sinos (Unisinos), São Leopoldo, RS, Brazil.

Corresponding author:
Email: panzenhagenac@gmail.com

Abstract

Objectives: Stressful events can impact the incidence of psychiatric disorders and, therefore, psychiatric drug use. However, it is not clear whether psychiatric drug use is stable or not across the Brazilian population over time. The aim of this study was to investigate trends in psychiatric drug sales in Brazil over the years, using sales data from private-sector pharmacies as a proxy for psychiatric drug consumption.
Methods: This is a non-interventional pharmacoepidemiological study using routinely collected health data from 2015 to 2021. The primary outcome was the amount of psychiatric drugs sold, corresponding to an individual or entity purchase recorded in the national system.

Results: We found an overall annual increase in psychiatric drug sales in the last few years (Z = -2748·7, p = 2·2 x 10^{-16}). Antidepressants and antipsychotics are by far the top seller psychiatric drugs. The south and southeast regions of Brazil and the state of Pará simultaneously show high levels of psychiatric drug sales, COVID-19 confirmed cases, and *per capita* income. We have raised hypotheses that might help explain the variations in psychiatric drug consumption. We provide evidence of a growing psychiatric drug sale over the years, likely reflecting an increase in psychiatric disorders or symptoms.

Conclusion: The trend reported here indicates an association between increased psychiatric drug sales and recent socioeconomic and health crises, including the COVID-19 pandemic, but causality cannot be established. This is possibly just the beginning of a major nationwide challenge that deserves attention going forward so that effective measures are implemented.

Keywords: Pharmacoepidemiology; Psychotropic Drugs; COVID-19 Pandemic; Brazil; Mental Health Services.

Introduction

It is difficult to tell whether psychiatric disorders are increasing in incidence over the years. There are several factors that may play a role in this dynamics. Psychiatric disorders are burdensome for the health of individuals and economically. Over the years, awareness has increased and stigmas are being dropped, which might have contributed to an increased ability to detect new cases.

Characterized by a high potential for contagion and mortality that exceeded 4·5 million deaths worldwide,[1] the Coronavirus Disease 19 (COVID-19) pandemic also had consequences on the physical and mental health of patients, health professionals, and the general population.[2,3] The inexistence of an effective pharmacological treatment meant that sanitary measures, such as social distancing, adequate hygiene, and masks, became the primary and most effective form of disease control,[4] while awaiting the results of global vaccination.

Recent global data indicate rising trends in psychiatric drug prescriptions and sales, particularly antidepressants and anxiolytics, across high- and middle-income countries[5]. These increases have been linked to greater mental health awareness, reduced stigma, and the impact of economic and health crises.[6,7] Understanding how

these global patterns manifest in Brazil is crucial, given the country's unique socioeconomic disparities and the role of both public and private healthcare systems in medication access.

Stressful life events and their impact on emotion and behavior are commonly necessary and carry evolutionary adaptive value. However, every person responds to environmental inputs differently, making some more vulnerable or resilient depending on life experience, genetic background, and complex interaction of several other different factors.[8] Nevertheless, sudden stressful events, such as increased demand, loss of friends and family, economic difficulties, or traumas (physical or emotional), are generally associated with a greater chance of developing or worsening psychiatric symptoms.[9] With COVID-19 and its preventive measures, people are mass-experiencing various stressful events simultaneously, such as isolation, distancing, overloaded working hours, fear, and grief.[10]

Brazil is already home to the population with the highest prevalence of major depressive disorder and anxiety disorders in Latin America,[11] which account, respectively, for the fifth and sixth causes of years lived with disability worldwide.[12] Therefore, the impact of the pandemic and post-pandemic outcomes are of major concern for public health. Despite the difficulty in estimating the real influence of crises in general on mental health, as well as the number of cases over the years, one way to assess them is through a longitudinal comparison between the sale of psychiatric drugs, which should reflect the population demand. Thus, we aimed at estimating the variation of psychiatric drug sales throughout the last few years to better understand the dynamics in psychiatric drug use and how crises might have affected the Brazilian population in terms of health and economic burden in this timeframe. As a secondary objective, we endeavored to correlate the data with COVID-19 cases and different Brazilian states.

Methods

Study design and setting

The present research is a non-interventional pharmacoepidemiological study using routinely collected health data from January 1st, 2015, to December 31st, 2021. We collected information on psychiatric drugs sold in Brazil, not using participant-level data.

Choice of primary measure

Each observation corresponds to an individual or entity (governmental or not) purchasing a certain amount of medicine packs (primary outcome). Unfortunately, we could not retrieve data on the presentation of drugs (dosage or quantity in the packs). However, the information is helpful as an index of increase or decrease of drug use over time, as we postulate that quantity and dosage remain reasonably constant in the population. Furthermore, the data reflects all drugs sold in the Brazilian private system. We have also sought to acquire data on the Unified Health System (SUS) but could not find any active national database.

Data sources

The data on drugs were collected from the National Controlled Products Management System (SNGPC) from the National Health Surveillance Agency (ANVISA). Private pharmacies and drugstores in Brazil mandatorily register the information in this system. It is a service that makes it possible to consult public data on consumer sales of controlled drugs —all psychiatric medications sold in Brazil fall within that category. The data has open access and grants automatic permission for use in research. The system provides the number of packs or boxes of medicine bought per state every month.

The data on income and estimated population per state comes from the R package *geobr*. COVID-19 data were extracted from the brasil.io website, covering the period from January 2020 to March 2021. Data extraction was performed in May 2021. We also retrieved data on the population corresponding to inhabitants 20 years of age or older (datasus.gov.br). We believe this would be a more accurate measure of the target population as most psychiatric drugs are prescribed to this subpopulation. These data were used for correlation analyses with psychiatric drug sales stratified by Brazilian state.

We collected the data on the active ingredients and presentations of medications from the Medicine Market Regulation Chamber (CMED), an inter-ministerial entity subordinated to ANVISA and responsible for the economic regulation of the medicine market in Brazil. Data extraction was performed in May 2021, referring to the CMED list for April 2019 and May 2020. We chose the manufacturer based on the lowest price policy for each presentation (minimum, median, and maximum). The same

manufacturer was selected for the following year, subject to availability. When not available, we chose the new active ingredient manufacturer based on the lowest price among the presentations. The price definition was indexed by the Maximum Consumer Price (PMC), characterized as the price to be applied by the drug retail trade, that is, pharmacies and drugstores, considering that this includes both the profit margin and the inherent taxes to these types of trade. The rate of the Tax on Circulation of Goods and Services (ICMS), a state tax, was indexed at 17·5% - the median of the amount charged in the national territory. The calculation of the total value (in Brazilian reais - R$) for each active ingredient was composed by multiplying the value (in Brazilian reais - R$) of each presentation (minimum, median, and maximum) of the active ingredient and the number of packs sold in the base year. A weighted average of the median presentation was calculated for the active ingredients citalopram, venlafaxine, and paroxetine since they have more than one specific active ingredient in the list (monohydrate, dihydrate, etc.).

This study relies exclusively on sales data from private-sector pharmacies registered in the SNGPC system. Data from the public health system (SUS), which serves a large proportion of vulnerable populations, were not available. This limitation may lead to an underestimation of overall psychiatric drug use and may bias findings toward populations with greater access to private-sector healthcare. We postulate that drug dosages and packaging sizes remained reasonably constant during the study period. However, variations in these factors could impact the interpretation of trends, as changes in packaging or dosage could artificially inflate or deflate the number of units sold without reflecting true changes in consumption. Although data on psychiatric prescriptions is not available, we evaluated the number of hospitalizations per 100,000 adult inhabitants Adult inhabitants refer to individuals 20 years of age or older that are registered with SUS. The analysis covers the period from 2015 to 2023 and examines two distinct categories of mental health conditions: "Mood disorders" and "Schizophrenia, schizotypal, and delusional disorders." These categories correspond to specific diagnostic codes within the International Classification of Diseases (ICD). The data for this analysis originates from DataSUS, the official public health information system of the Brazilian Ministry of Health. Specifically, the data was retrieved from the TabNet portal, which allows for the tabulation of health data.

Psychiatric drugs

All the active principles included were also divided and tested by groups, according to the drug classes categorized by Sadock et al., 2017,[13] as follows: *antidepressants* (amitriptyline, clomipramine, imipramine, nortriptyline, citalopram, escitalopram, fluoxetine, fluvoxamine, paroxetine, sertraline, bupropion, desvenlafaxine, duloxetine, mirtazapine, trazodone, venlafaxine, agomelatine, vortioxetine, and tranylcypromine), *antipsychotics* (chlorpromazine, fluphenazine, haloperidol, pimozide, thioridazine, trifluoperazine, aripiprazole, clozapine, olanzapine, paliperidone, quetiapine, risperidone, ziprasidone), *benzodiazepines* (alprazolam, clonazepam, chlordiazepoxide, diazepam, lorazepam, midazolam), *mood stabilizers* (valproic acid, carbamazepine, lithium, and lamotrigine), *dopaminergic or adrenergic agonists* (methylphenidate, lisdexamfetamine, and modafinil), and *others* (biperiden, zolpidem, buspirone, promethazine, methadone, and naltrexone).

Statistical procedures

Although the information on psychiatric drug sales should follow a normal distribution at baseline, the data retrieved from the SNGPC does not, mainly because it is not always presented at the individual level. For instance, an institution might purchase many drugs at once, or even one individual can acquire two or three months' worth of medicine, and it would be reported as a single entry. Thus, statistics based on mean, standard deviation, or other parametric analyses or graph types are not applicable. In order to test the association between the proportion of psychiatric drugs sold (the denominator being the population over 20 years old) and the last few years, we applied the Cochran-Armitage trend test (two-sided and considering an alpha of 0·05). We have also performed Pearson's correlation (alpha = 0·05) between income, COVID-19 cases, COVID-19 death rate, population size, and psychiatric drug sales between the years of 2015 and 2020. All analyses and plots were generated using the R environment with the following packages: *base*, *stats*, *geobr*, *DescTools*, *psych*, *dplyr*, *ggplot2*, and *RColorBrewer*.

We used the Cochran-Armitage trend test to assess changes in drug sales over time, as this test is appropriate for detecting linear trends in proportions across ordered groups. Pearson's correlation was used to explore associations between continuous variables (income, COVID-19 cases, death rates, population size, and

drug sales), as it is suitable for normally distributed data; we assessed normality visually and with Shapiro-Wilk tests, confirming that the data were appropriate for these analyses.

Results

The number of psychiatric drug packs sold in each year was 122275161 (2015), 131317716 (2016), 149432837 (2017), 155583810 (2018), 176641617 (2019), 192088216 (2020), and 45620425 (first three months of 2021). We found an overall annual increase in psychiatric drug sales in the last few years (Figure 1), with a significant trend ($p < 2{\cdot}2 \times 10^{-16}$) and a statistics $Z = 2751{\cdot}4$. In Table S1 we provide the summary statistics for all the data on psychiatric drugs sold in Brazil from January 2015 to March 2021.

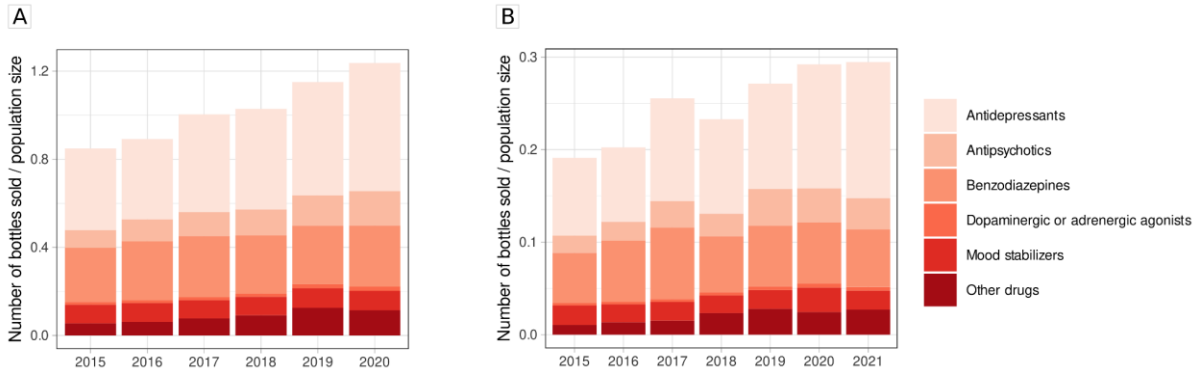


Figure 1. Annual sales of psychiatric drugs per capita in Brazil from 2015 to 2021. The graphs show a consistent year-over-year increase in the number of psychiatric drug packs sold, normalized by the population aged 20 years or older. Antidepressants are the most sold drug class and show the most significant growth, driving the overall upward trend. Data represents sales from private-sector pharmacies registered in Brazil's National Controlled Products Management System (SNGPC) and excludes data from the public health system (SUS). The drug classes analyzed are antidepressants, antipsychotics, benzodiazepines, dopaminergic or adrenergic agonists, mood stabilizers, and others. A) Data based on the full twelve months of each year from 2015 to 2020, showing a steady rise in total sales. B) Data based on the first three months (January–March) of each year from 2015 to 2021, reflecting a continued increase in early-year sales.

Antidepressants are by far the best seller psychiatric drugs and the class with the most expressive increase across the years when controlled by population rise ($p <$

2·2 x 10^{-16}, Z = -2608·4), aside from a slight reduction in 2016 (Figure 2). The number of antipsychotic drugs sold also increases annually ($p < 2·2 \times 10^{-16}$, Z = -2082·7), although less expressively (Figure 2A). However, when we look at the first three months of 2020 and 2021, we see a decrease in the number of antipsychotics sold (Figure 2B). The sale of mood stabilizers ($p < 2·2 \times 10^{-16}$, Z = -515·47) and dopaminergic and adrenergic agonists ($p < 2·2 \times 10^{-16}$, Z = -651·14) also increased over the years (Figure 2A). Benzodiazepines present an increase every year ($p < 2·2 \times 10^{-16}$, Z = -295·65), except for 2018 (Figure 2), and the “other drugs” category also presents an increase ($p < 2·2 \times 10^{-16}$, Z = -2325·7), apart from 2021.

The south and southeast regions of Brazil, together with the state of Pará, simultaneously show high levels of psychiatric drug sales, COVID-19 confirmed cases, and *per capita* income (Figure 3). Higher psychiatric drug sales in the southern and southeastern regions, as well as in Pará, may reflect differences in healthcare infrastructure, economic conditions, and access to mental health services. These regions have higher per capita income[14] and more robust healthcare networks, which may facilitate both diagnosis and treatment of psychiatric conditions.

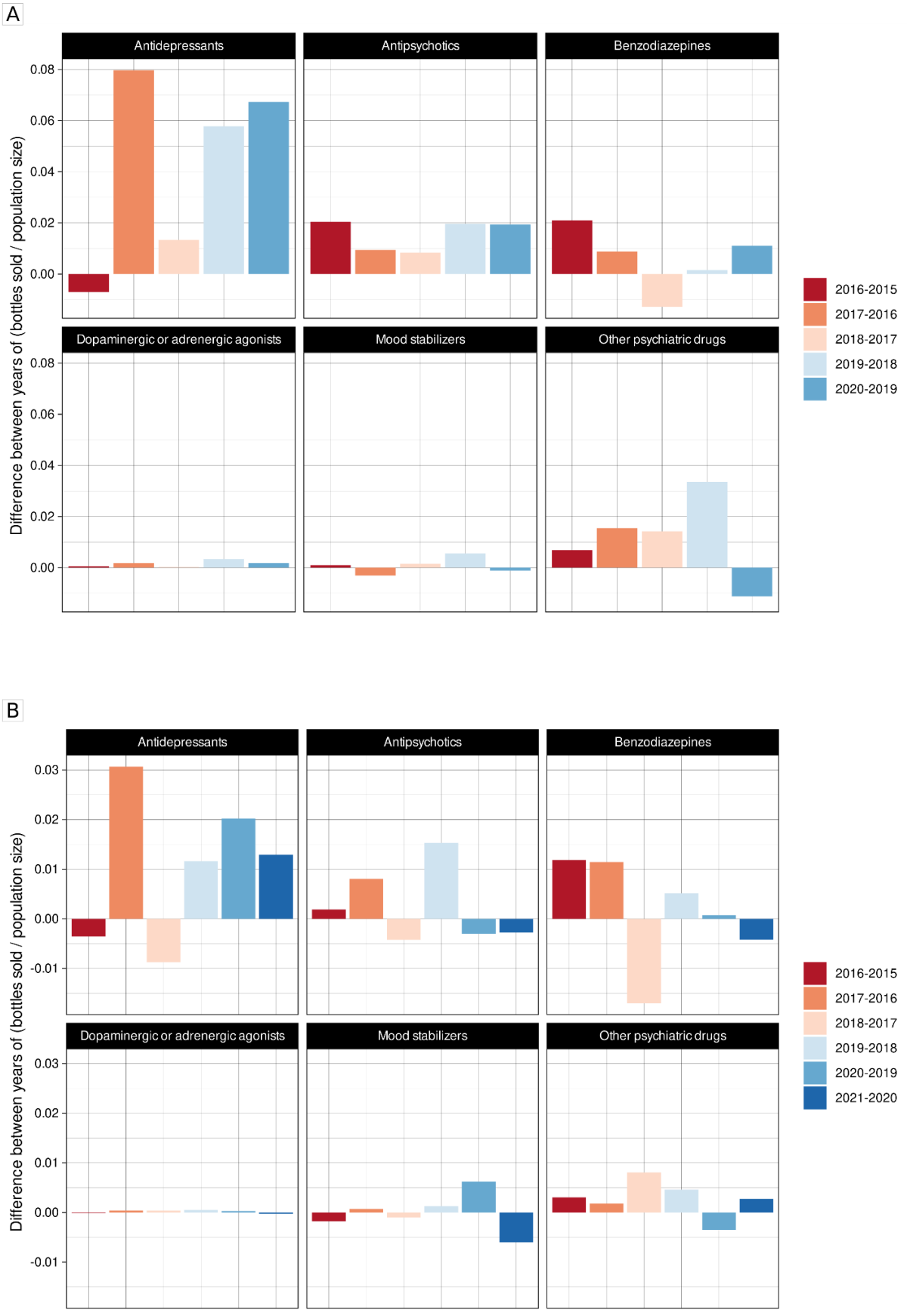


Figure 2. Year-over-year change in psychiatric drug sales per capita in Brazil (2015–2021). The graphs

illustrate the annual difference in sales for major drug classes, with positive bars indicating growth and negative bars indicating a decline compared to the previous year. Data is sourced from private-sector pharmacies (excluding the public health system, SUS) for the population aged 20 years or older. A) Based on the full twelve months (2015-2020), this graph highlights that the most substantial growth for antidepressants occurred between 2016-2017 and 2019-2020, periods marked by significant national crises. B) Based on the first three months of each year (2015-2021), this graph shows a notable drop in antipsychotic sales in early 2021, potentially due to reduced hospital access during a severe COVID-19 wave.

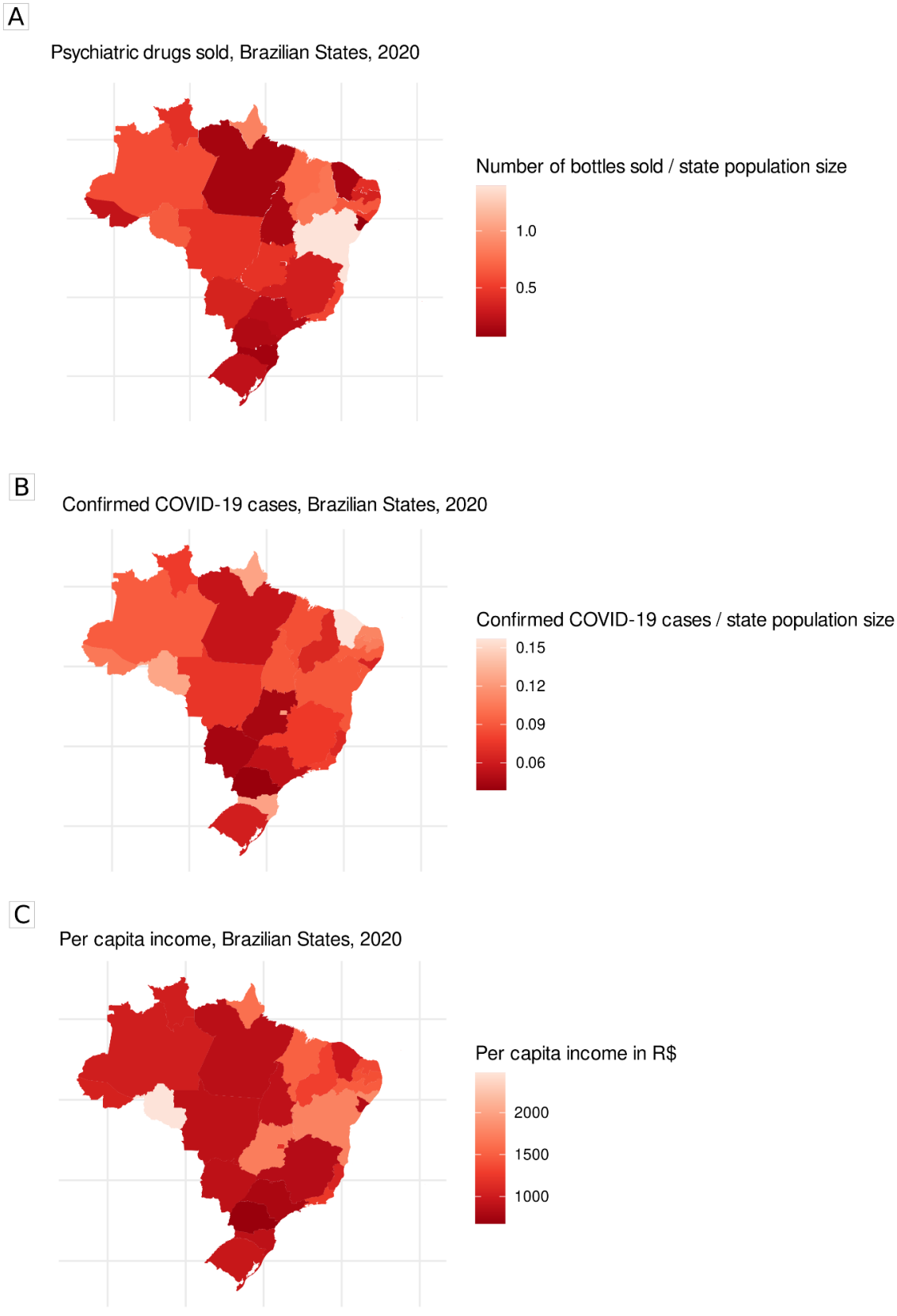
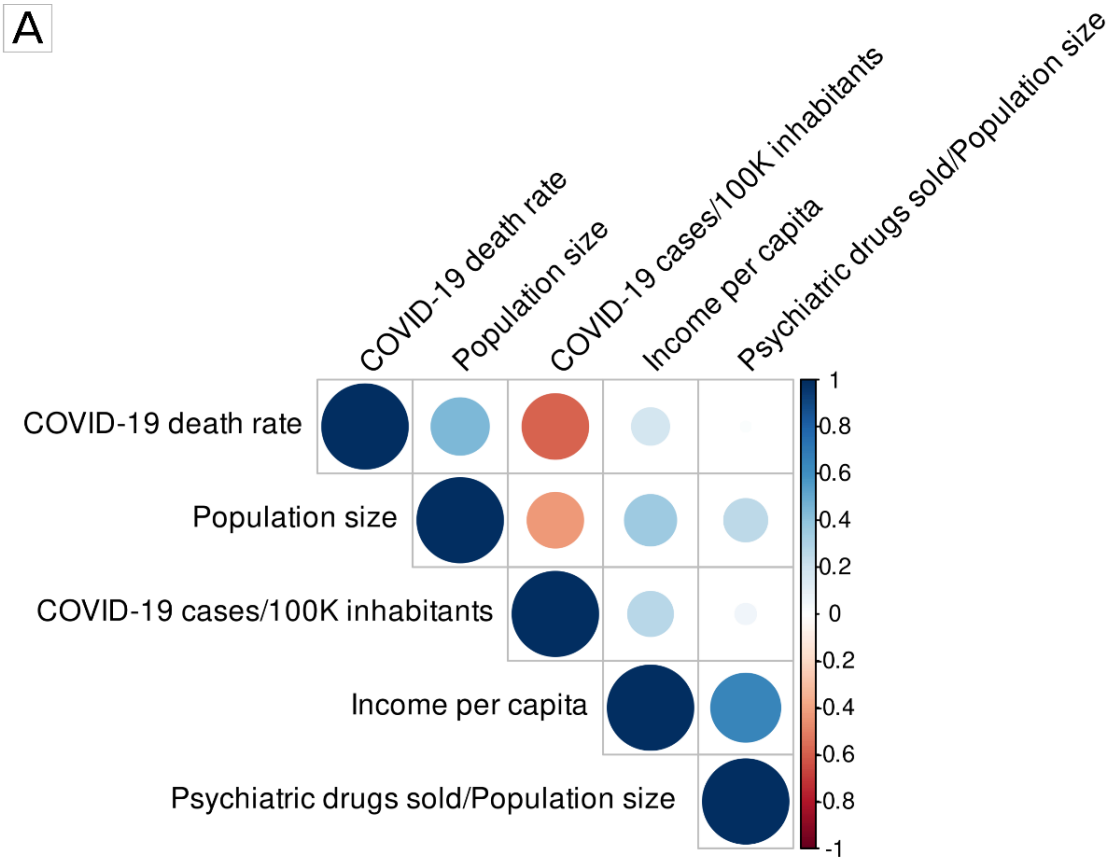


Figure 3. Geographic distribution of psychiatric drug sales, COVID-19 cases, and income across Brazilian states. The maps reveal a strong visual overlap, with darker shades indicating higher values.

The South and Southeast regions, along with the state of Pará, emerge as hotspots with high levels of psychiatric drug sales, COVID-19 cases, and per capita income. This suggests a potential link between urbanization, economic conditions, healthcare access, and the variables measured. Data on drug sales is from private-sector pharmacies for all analyzed psychiatric classes and does not include the public health system (SUS). A) The number of psychiatric drug packs sold in 2020, divided by the state population aged 20 years or older. B) The number of confirmed COVID-19 cases in 2020, divided by the total state population. C) The per capita income in Brazilian reais (R$) for each state in 2019.

Moreover, we have investigated the correlations between income, COVID-19 cases, COVID-19 death rate, population size, and psychiatric drug sales. The Pearson correlation coefficients, histograms and scatter plots are depicted in Figure 4, although the only significant correlation (< 0·05) is the one between COVID-19 cases/100K inhabitants and COVID-19 death rate.


A
COVID-19 death rate
Population size
COVID-19 cases/100K inhabitants
Income per capita
Psychiatric drugs sold/Population size
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1

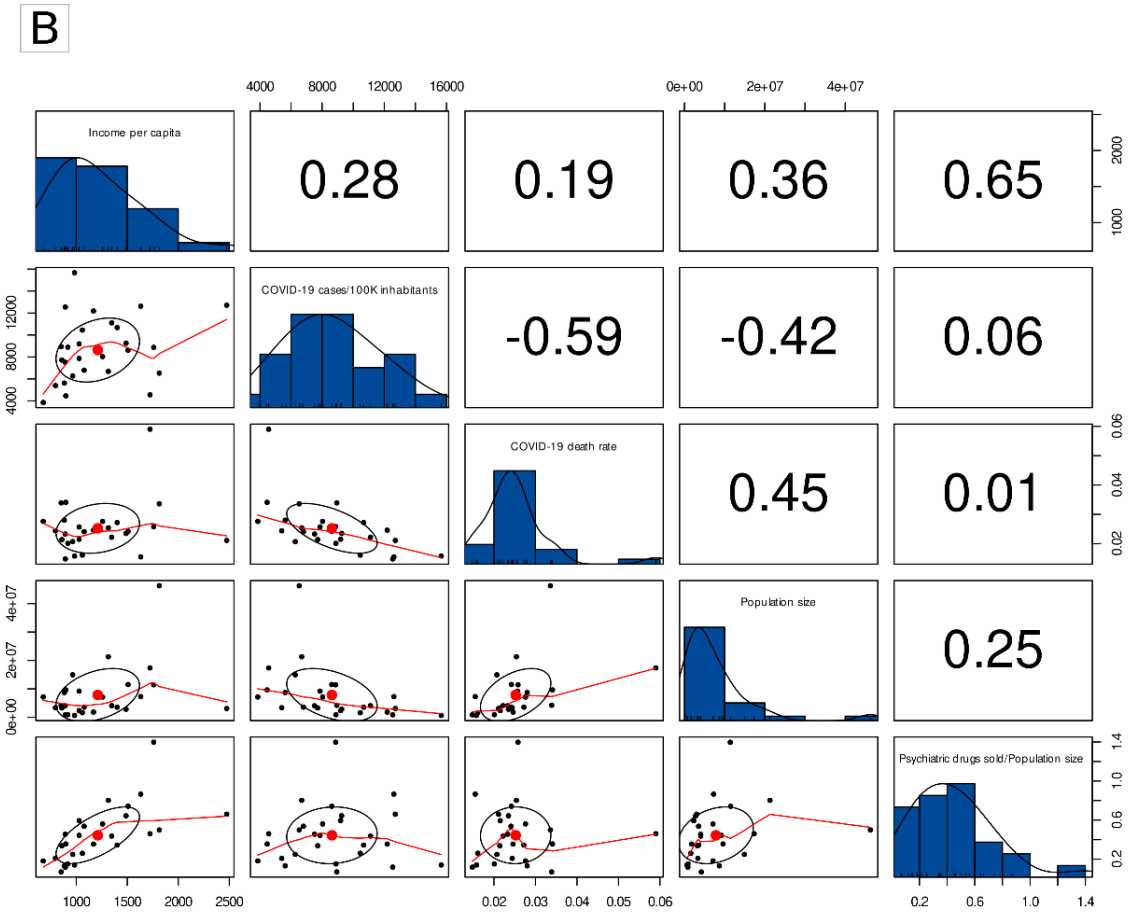

B
Income per capita
COVID-19 cases/100K inhabitants
COVID-19 death rate
Population size
Psychiatric drugs sold/Population size
0.28
0.19
0.36
0.65
-0.59
-0.42
0.06
0.45
0.01
0.25

Figure 4. Correlation matrix of psychiatric drug sales, COVID-19 metrics, and socioeconomic variables in Brazil. The figure displays Pearson correlation coefficients (upper right), data distribution histograms (diagonal), and scatter plots (lower left) for state-level variables from 2019 and 2020. Despite visual suggestions of relationships between income and drug sales, the analysis found only one statistically significant correlation ($p = 0.014$): the positive relationship between the rate of COVID-19 cases and the COVID-19 death rate. Drug sales data are from private-sector pharmacies, normalized by the population aged 20 or older, and exclude public-sector (SUS) data.

Furthermore, we estimated how much was spent on psychiatric drugs in 2019 and 2020 (Table S2). We have selected different drug presentations in order to estimate the minimum amount and the maximum amount that was spent according to the data on the number of packs sold. We found an increase of at least 1·3 billion Brazilian reais (R$) spent between 2019 and 2020. This amount can go as high as 2·2 billion R$ if we consider the most expensive presentations.

The data presented in Table S3 displays trends in hospitalization rates for two categories of disorders. For mood disorders, the hospitalization rate per 100,000 adults fluctuated over the period. It started at 31.0 in 2015, saw a slight dip in 2016 (30.2), and then gradually increased to a pre-pandemic peak of 35.8 in 2019. A notable decrease occurred in 2020, with the rate dropping to 30.0. Following this, the rate saw a slight increase in 2021 to 30.2 and continued to rise, reaching 33.3 in 2022 and peaking at 37.6 in 2023, the highest point in the observed period. In contrast, hospitalizations for schizophrenia, schizotypal, and delusional disorders showed a more pronounced downward trend, followed by a partial recovery. Throughout the entire period, the hospitalization rate for schizophrenia and related disorders remained consistently higher than that for mood disorders.

Discussion

The most expressive increases in antidepressant sales took place in memorable timeframes (2017 and 2020/21), marked by two of Brazil's major crises in the last decades. The year 2017 followed two years of great economic and political instability. In 2015, Brazil faced the largest inflation rate since 2002 (https://www.ibge.gov.br/). In the following year (2016), its president, Dilma Rousseff, was impeached, leaving Michel Temer (former vice-president) in power until the next elections reflecting an important political instability in the country. Moreover, the Zika

virus outbreak was the largest outbreak of this type of virus in history and occurred precisely between April 2015 and November 2016 (https://www.ipea.gov.br/). The Zika virus is not disseminated through the same means as SARS-CoV-2, and therefore no lockdown or isolation measures were put in place. It is reasonable to argue that the influence of the Zika epidemic would not have as expressive an influence on mental health as SARS-CoV-2 most likely will.

One can imagine such events would leave long-lasting consequences, mainly economic, which could increase and even trigger psychological responses, such as depressive symptoms or anxiety due to the uncertain atmosphere. Later on, COVID-19 broke at the beginning of 2020, which led to unimaginable sanitary and economic outcomes, amounting to more than 600 thousand deaths up to now (https://covid.saude.gov.br/) and the biggest inflation spike in 22 years.[15] The observed increase in psychiatric drug sales during the pandemic period is associated with the timing of COVID-19, but other factors such as heightened mental health awareness, changes in healthcare-seeking behavior, and economic stressors may also contribute.

Although the antipsychotic drug sales increased in 2020, when we look at the differences between the years, we see a drop in the first months of both 2020 and 2021 (Figure 2B), which might seem controversial. Nonetheless, considering that the beginning of both years was marked by restricted access to hospitals due to COVID-19 and, therefore, diagnosis and treatment, it may not be that surprising. In the first months of 2020, Brazil adhered to lockdown and other health safety measures, closing schools and some companies.[16] In addition, from January to March 2021, Brazil experienced a spike in COVID-19 cases, which led to overwhelmed hospitals and reduced inpatient capacity - over 320 thousand deaths were reported due to COVID-19 only in these three months (https://covid.saude.gov.br/). The same trend was not seen in antidepressant drugs consumption though, which could be related to the very nature of the conditions. Depressive and anxiety symptoms fall within an internalizing category and, therefore, are characterized by harm to the own individual through everyday task impairment and excessive response to demand, which is consistent with the fact that depressed patients seek medical attention more frequently. On the other hand, psychotic breaks are more related to externalizing

phenotypes, which are more burdensome to others, and the affected individual might not always seek immediate help.[17,18]

We also see a decrease in antidepressant and antipsychotic sales at the beginning of 2018, which could be associated with the negative outgrowths in the economy due to previous years' events. Furthermore, COVID-19 has contributed to a considerable setback in the Brazilian health system overall. There is also an exceeding amount of alcohol consumption and domestic violence outbreaks reported throughout the last year,[19] which might be associated with other disorders left untreated, possibly due to health system limitations. Recent studies have shown that economic and health crises, such as the COVID-19 pandemic, are associated with increased psychiatric drug use globally[6,7], reflecting broader mental health challenges and increased demand for mental health services.

Concerning the geographical distribution of COVID-19 cases and the sale of psychiatric drugs, both coincide in the urban areas of Brazil, especially in the south and southeast regions (Figure 3A and 3B). In the case of COVID-19, this could be mainly related to more bustling environments (where the contagion rate ends up being higher due to larger populations, increased physical contact, and proximity between individuals). On the other hand, the high psychiatric drugs sale (and possibly associated psychiatric disorder prevalence) in the urban areas is most likely related to higher demand and increased access to treatment facilities and, therefore, enhanced diagnosis. Nonetheless, we cannot dismiss any other possible genuine associations such as environmental factors, COVID-19 infection itself, and exposure to the media. Although not possible to be verified in our work, a recent study showed compelling evidence of what has been called "long-covid", expressive psychiatric and cognitive impairments associated with SARS-CoV-2 infection, both in symptomatic and asymptomatic patients.[20] Taken together, these factors highlight the importance of health care measures to mitigate the effects of COVID-19 in the long run.

The estimated cost linked with the sale of psychiatric drugs is undoubtedly alarming and most likely underestimated. Besides the economic impact for individuals in the private system shown here Table S1, the effect must be even greater on the public health system, which provides care for approximately 70% of Brazilians.[21]

The observed trends in hospitalization rates for mood disorders and schizophrenia-related disorders in Brazil from 2015 to 2023 are likely influenced by a combination of factors, including changes in mental healthcare policy, the impact of the COVID-19 pandemic, and the differing nature of the disorders themselves. The notable drop in hospitalizations for both categories in 2020 strongly suggests an impact from the COVID-19 pandemic. The pandemic led to widespread lockdowns, a redirection of healthcare resources towards managing the virus, and public fear of contracting the virus in hospital settings.[22] This likely resulted in a deferral of care for non-emergency conditions, including psychiatric hospitalizations. The post-2020 increase in hospitalizations for mood disorders, culminating in the 2023 peak, could be interpreted as a "rebound" effect.

The overall decline in hospitalizations for schizophrenia and related disorders from 2015 to 2020 may be indicative of a broader shift in Brazilian mental healthcare policy, emphasizing deinstitutionalization and the increase of community-based mental health services (such as the Centros de Atenção Psicossocial - CAPS). While long-term policy shifts may be driving down hospitalizations for severe chronic conditions like schizophrenia, acute societal stressors like the COVID-19 pandemic might have significantly impacted hospitalization patterns, with a notable surge in the need for acute care for mood disorders in the post-pandemic period, agreeing with the data on psychiatric drug sales from the private sector. It is interesting to note that this data is directly proportional to the total capacity of the public health system in terms of facilities and professionals and should not be taken at face value and may not reflect the overall psychiatric burden within the country.

Our results should be viewed in light of some limiting factors. First, we could not acquire data on the whole population since records are not systematically kept in the public health system, therefore, a key limitation of this study is the reliance on private-sector sales data, excluding the substantial portion of the population served by SUS. This may limit the generalizability of our findings and underestimate true psychiatric drug consumption in Brazil. Additionally, the lack of data on drug dosages and packaging, as well as potential regional differences in prescribing practices, may affect the accuracy of our estimates. And second, the costs of drugs sold are estimated based on standard prices, but they may vary.

After 2021 developments and the vast impact the pandemic has had and continues to impose on Brazil's sanitary and economic conditions, the issues reported here deserve even more attention going forward so that preventive and easily accessible health measures are implemented. All risk factors for the very same disorders that we report are increasing. It is time for decision-makers to tackle this escalating and ever-growing problem, if not for humanitarian or sanitary reasons, then for economic ones. Based on our findings, we recommend expanding access to mental health services, particularly within the public health system (SUS), to address unmet needs among vulnerable populations. Policymakers should consider targeted interventions in regions with lower access to care and invest in public health campaigns to reduce stigma and improve early detection of psychiatric disorders.

Statements and Declarations

The authors declare no conflict of interest.

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Author contributions

CRediT TaxonomyAlana PanzenhagenCRediT contribution not specifiedAugusto Cezar Sartori MaffiniData curation-Equal, Formal analysis-Equal, Writing - review & editing-EqualRaul DantasData curation-Equal, Formal analysis-Equal, Writing - review & editing-EqualKen ShimomuraData curation-Equal, Writing - review & editing-EqualMaria Letícia Rodrigues IkedaMethodology-Equal, Software-Equal, Writing - review & editing-EqualDaniel Pens GelainMethodology-Equal, Writing - review & editing-EqualJosé Cláudio Fonseca MoreiraConceptualization-Equal, Writing - review & editing-EqualFlavio Milman ShansisConceptualization-Equal, Project administration-Equal, Writing - review & editing-Equal.

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Supplementary material

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Table S1. Summary statistics for all the data on psychiatric drugs sold in Brazil from January 2015 to March 2021

Psychiatric drug group Year	Summary statistics					
Antidepressants	**Minimum**	**1st IQ**	**Median**	**Mean**	**3rd IQ**	**Maximum**
2015	1	1	2	10.7	5	792671
2016	1	1	2	9.9	5	851910
2017	1	1	2	10.9	5	970622
2018	1	1	2	10.5	5	878583
2019	1	1	2	10.8	5	789671
2020	1	1	2	11.3	5	789956
2021[a]	1	1	2	11	5	694465
Antipsychotics						
2015	1	1	3	8.2	5	392567
2016	1	1	3	9.3	5	789698
2017	1	1	3	9.5	5	789642
2018	1	1	2	9.8	5	789755
2019	1	1	2	10.7	5	789747
2020	1	1	2	11.2	6	790062
2021[a]	1	1	2	9.42	6	21336
Benzodiazepines						
2015	1	2	3	14.4	6	790457
2016	1	2	3	15.5	7	789831
2017	1	2	3	14.7	7	923903
2018	1	2	3	14.7	7	789632
2019	1	2	3	15	7	789578
2020	1	2	3	15.2	7	913662
2021[a]	1	2	3	14.01	7	62018
Dopaminergic and adrenergic agonists						
2015	1	1	2	9.271	5	4697
2016	1	1	2	9.666	5	3526
2017	1	1	2	10.28	5	5605
2018	1	1	2	11.79	5	8129
2019	1	1	2	10.98	5	6960
2020	1	1	2	13.2	4	789115
2021[a]	1	1	2	9.49	4	4031
Mood stabilizers						
2015	1	2	3	11.3	6	789115
2016	1	2	3	10.7	6	789669
2017	1	2	3	9.94	6	173420
2018	1	2	3	10.3	6	789609

2019	1	2	3	10.7	6	789645
2020	1	2	3	10.4	6	789249
2021[a]	1	2	3	9.7	6	6037
Other drugs						
2015	1	1	2	13.1	5	789623
2016	1	1	3	13.3	6	527438
2017	1	1	3	15.5	6	721592
2018	1	1	3	15.8	6	789599
2019	1	1	2	17.3	6	902332
2020	1	1	2	14.2	6	789620
2021[a]	1	1	2	12.69	5	29891
Overall						
2015	1	1	2	11.4	6	792671
2016	1	1	2	11.3	6	851910
2017	1	1	2	11.8	6	970622
2018	1	1	2	11.6	6	878583
2019	1	1	2	12	6	902332
2020	1	1	2	12.1	6	913662
2021[a]	1	1	2	11.3	6	694465

IQ = Interquartile. Data based on number of bottles/boxes sold. [a]Data from January to March 2021.

Table S2. Estimation of the value spent on psychiatric drugs during the years of 2019 and 2020

Psychiatric drug group/year Drug	**Brand**	**Presentation minimum/median/maximum**	**Maximum Consumer Price (PMC)**	**Number of bottles or boxes bought/year**	**Value in Brazilian reais (R$)**
Antidepressants/2019					
Amitriptyline	CRISTALIA	10mg 30cp	R$13.31	7063796	R$94,019,124.76
	GERMED	25mg 30cp	R$26.40		R$186,484,214.40
	NOVA QUIMICA	75mg 30cp	R$63.55		R$448,904,235.80
Clomipramine	EMS	10mg 20cp	R$11.93	1223265	R$14,593,551.45
	EMS	25mg 20cp	R$26.52		R$32,440,987.80
	NOVARTIS	75mg 20cp	R$89.50		R$109,482,217.50
Imipramine (hydrochloride)	ASPEN PHARMA	10mg 20cp	R$12.14	1329682	R$16,142,339.48
	NOVARTIS	75mg 30cp	R$66.72		R$88,716,383.04
	NOVARTIS	150mg 30cp	R$116.80		R$155,306,857.60
Imipramine (pamoate)	ASPEN PHARMA	10mg 20cp	R$12.14	4585	R$55,661.90
	CRISTALIA	25mg 20cp	R$9.54		R$43,740.90
	NOVARTIS	75mg 30cp	R$66.72		R$305,911.20
Nortriptyline	NOVARTIS	10mg 30cp	R$28.56	1616863	R$46,177,607.28
	NOVARTIS	50mg 30cp	R$65.14		R$105,322,455.82
	NOVARTIS	75mg 30cp	R$87.95		R$142,203,100.85
Citalopram	ACTAVIS	20mg 14x2cp	R$60.81	4374796	R$266,031,344.76
	MEDLEY	20mg 30cp	R$67.88		R$296,961,152.48
	LIBBS	40mg 28cp	R$130.82		R$572,310,812.72
Escitalopram (oxalate)	SANDOZ	10mg 30cp	R$65.61	11241322	R$737,543,136.42
	UNIÃO QUIMICA	15mg 30cp	R$85.82		R$964,730,254.04
	SANDOZ	20mg 30cp	R$101.13		R$1,136,834,893.86
Fuoxetine	EUROFARMA	10mg 28cp	R$28.75	7428878	R$213,580,242.50
	GLOBO	20mg 30cp	R$29.54		R$219,449,056.12
	MEDQUIMICA	20mg 60cp	R$74.64		R$554,491,453.92
Fuvoxamine	ABBOTT	50mg 30cp	R$78.51	412407	R$32,378,073.57

	ABBOTT	50mg 30cp	R$124.14		R$51,196,204.98
	ABBOTT	100mg 60cp	R$289.39		R$119,346,461.73
	SANDOZ	20mg 30cp	R$54.80		R$296,846,339.20
Paroxetine	EUROFARMA	25mg 20cp	R$101.84	5416904	R$551,657,503.36
	EUROFARMA	30mg 3x10cp	R$228.99		R$1,240,416,846.96
	MOMENTA	25mg 30cp	R$49.20		R$545,593,609.20
Sertraline	AUROBINDO	50mg 30cp	R$53.58	11089301	R$594,164,747.58
	BIOSINTETICA	75mg 30cp	R$358.92		R$3,980,171,914.92
	NOVA QUIMICA	150mg 30cp	R$69.65		R$177,304,243.90
Bupropion	NOVA QUIMICA	150mg 60cp	R$144.63	2545646	R$368,176,780.98
	NOVA QUIMICA	300mg 60	R$691.83		R$1,761,154,272.18
	MEDLEY	50mg 30cp	R$106.53		R$486,042,166.23
Desvenlafaxine	MEDLEY	100mg 30cp	R$117.27	4562491	R$535,043,319.57
	-	-	-		-
	EMS	30mg 7cp	R$35.89		R$195,891,496.12
Duloxetine	EMS	30mg 30cp	R$231.13	5458108	R$1,261,532,502.04
	EMS	60MG 60CP	R$940.25		R$5,131,986,047.00
	EMS	15mg 30cp	R$87.98		R$199,213,817.84
Mirtazapine	EMS	30mg 30cp	R$176.03	2264308	R$398,586,137.24
	EMS	45mg 30cp	R$250.26		R$566,665,720.08
	TORRENT	50mg 30 cp	R$29.06		R$106,584,291.92
Trazodone	TORRENT	100mg 30cp	R$58.24	3667732	R$213,608,711.68
	APSEN	150mg 30 cp	R$134.54		R$493,456,663.28
	EUROFARMA	37.5mg 30cp	R$35.47		R$244,503,754.85
Venlafaxine (hydrochloride)	EUROFARMA	75mg 30cp	R$83.08	6893255	R$572,691,625.40
	MEDLEY	150mg 30cp	R$98.29		R$677,538,033.95
	EMS	25mg 15cp	R$71.18		R$10,586,387.86
Agomelatine	EMS	25mg 30cp	R$142.38	148727	R$21,175,750.26
	EMS	25MG 60cp	R$284.75		R$42,350,013.25
	LUNDBECK	5mg 30cp	R$203.78		R$62,631,986.78
Vortioxetine	LUNDBECK	10mg 30cp / 5mg 60cp	R$407.61	307351	R$125,279,341.11
	LUNDBECK	10mg 60cp	R$815.22		R$250,558,682.22
	GLAXOSMITHKLINE	10mg 20cp	R$32.99		R$1,351,633.29
Tranylcypromine	GLAXOSMITHKLINE	10mg 20cp	R$34.42	40971	R$1,410,221.82
	-	-	-		-
Total (minimum)					R$ 3,747,070,809.31
Total (maximum)					R$ 17,919,937,680.41
Antipsychotics/2019					
	SANOFI	25mg 20cp	R$6.95		R$10,092,261.80
Chlorpromazine	SANOFI	100mg 20cp	R$10.38	1452124	R$15,073,047.12
	-	-	-		-
	CRISTALIA	5mg 200	R$48.83		R$2,587.99
Fluphenazine	-	-	-	53	-
	-	-	-		-
	JANSSEN-CILAG	1mg 20cp	R$6.39		R$17,801,907.39
Haloperidol	PRATI DONADUZZI	2mg/ml 1 frasco	R$8.97	2785901	R$24,989,531.97
	CRISTALIA	5mg 20cp	R$6.50		R$18,108,356.50
	JANSSEN-CILAG	1mg 20cp	R$13.88		R$476,236.68
Pimozide	JANSSEN-CILAG	4mg 20cp	R$23.92	34311	R$820,719.12
	-	-	-		-
	UNIÃO QUIMICA	25mg 20cp	R$15.37		R$17,733,752.30
Thioridazine	UNIÃO QUIMICA	50mg 20cp	R$18.50	1153790	R$21,345,115.00
	UNIÃO QUIMICA	100mg 20cp	R$33.75		R$38,940,412.50
	GLAXOSMITHKLINE	2mg 20cp	R$9.15		R$1,238,132.25
Trifluoperazine	GLAXOSMITHKLINE	5mg 20cp	R$13.19	135315	R$1,784,804.85
	-	-	-		-
	SANDOZ	10mg 30cp	R$200.51		R$71,394,392.64
Aripiprazole	SANDOZ	20mg 30cp	R$625.76	356064	R$222,810,608.64
	SANDOZ	30mg 30cp	R$ 1,023.70		R$364,502,716.80

	SUPERA FARMA	25mg 230cp	R$41.63		R$10,314,498.58
Clozapine	SUPERA FARMA	100mg 30cp	R$167.46	247766	R$41,490,894.36
	-	-	-		-
	ZYDUS	2.5mg 30cp	R$61.30		R$97,263,054.90
Olanzapine	ZYDUS	5mg 30cp	R$67.03	1586673	R$106,354,691.19
	ZYDUS	10mg 30cp	R$67.42		R$106,973,493.66
	JANSSEN-CILAG	9mg 28cp	R$1,269.26		R$23,222,380.96
Paliperidone	JANSSEN-CILAG	6mg 28cp	R$818.07	18296	R$14,967,408.72
	JANSSEN-CILAG	3mg 28cp	R$408.97		R$7,482,515.12
	CRISTALIA	50mg 30cp	R$109.43		R$785,956,353.25
Quetiapine	EUROFARMA	100mg 30cp	R$120.08	7182275	R$862,447,582.00
	EUROFARMA	200mg 30cp	R$244.60		R$1,756,784,465.00
	SANDOZ	1mg 30cp	R$31.60		R$187,158,394.40
Risperidone	SANDOZ	2mg 30cp	R$31.60	5922734	R$187,158,394.40
	SANDOZ	3mg 30cp	R$31.60		R$187,158,394.40
	PFIZER	20mg/ml 1 frasco	R$243.60		R$2,450,372.40
Ziprasidone	EMS	40mg 30cp	R$298.87	10059	R$3,006,333.33
	EMS	80mg 30cp	R$497.47		R$5,004,050.73
Total (minimum)					R$1,225,104,325.54
Total (maximum)					R$ 2,544,126,458.15
Benzodiazepines/2019					
	EMS	0.5mg 30cp	R$11.06		R$141,167,185.60
Alprazolam	EMS	1mg 30cp	R$21.65	12763760	R$276,335,404.00
	MEDLEY	2mg 30cp	R$63.19		R$806,541,994.40
	ROCHE	0.25mg 30cp	R$6.88		R$145,066,781.44
Clonazepam	GEOLAB	0.5mg 30cp	R$8.46	21085288	R$178,381,536.48
	ZYDUS	2mg 30cp	R$13.89		R$292,874,650.32
	VALEANT	12.5mg + 5mg 20	R$10.89		R$7,695,549.18
Chlordiazepoxide	-	-	-	706662	-
	-	-	-		-
	NEO QUIMICA	5mg 30cp	R$11.27		R$34,065,603.60
Diazepam	NEO QUIMICA	10mg 30cp	R$15.23	3022680	R$46,035,416.40
	-	-	-		-
	WYETH	1mg 30cp	R$26.35		R$67,895,781.50
Lorazepam	RANBAXY	2mg 30cp	R$13.13	2576690	R$33,831,939.70
	-	-	-		-
	ROCHE	7.5mg 3x10cp	R$52.10		R$17,743,023.98
Midazolam	UNIÃO QUIMICA	15mg 30cp	R$59.20	337898	R$20,003,561.60
	-	-	-		-
Total (minimum)					R$ 413,633,925.30
Total (maximum)					R$ 1,206,983,111.60
Mood stabilizers/2019					
	BIOLAB SANUS	250mg 25cp	R$15.54		R$84,130,980.36
Valproic Acid	ABBOTT	250mg 50cp	R$47.80	5413834	R$258,781,265.20
	SANOFI	500mg 40cp	R$41.98		R$227,272,751.32
	TEUTO	200mg 30cp	R$17.61		R$88,310,522.34
Carbamazepine	TEUTO	400mg 30cp	R$35.32	5014794	R$177,122,524.08
	-	-	-		-
	SUPERA FARMA	300mg 25cp	R$19.02		R$63,890,500.44
Lithium	ACTAVIS	300mg 50cp	R$24.68	3359122	R$82,903,130.96
	SUPERA FARMA	450mg 30cp	R$54.83		R$184,180,659.26
	ALTHAIA	25mg 30cp	R$23.72		R$69,341,102.96
Lamotrigine	ALTHAIA	50mg 30cp	R$38.74	2923318	R$113,249,339.32
	ALTHAIA	100mg 30cp	R$65.22		R$190,658,799.96
Total (minimum)					R$ 305,673,106.10
Total (maximum)					R$ 779,234,734.62
Dopaminergic or adrenergic agonists /2019					

	EMS	10mg 30cp	R$25.72		R$51,632,128.40
Methylphenidate	NOVARTIS	20mg 30cp	R$268.86	2007470	R$539,728,384.20
	NOVARTIS	30mg 30cp	R$282.30		R$566,708,781.00
	SHIRE	30mg 28cp	R$358.42		R$228,409,238.14
Lisdexamfetamine	SHIRE	50mg 28cp	R$434.63	637267	R$276,975,356.21
	SHIRE	70mg 28cp	R$434.63		R$276,975,356.21
	LIBBS	100mg 30cp	R$123.37		R$9,919,194.74
Modafinil	LIBBS	200mg 30cp	R$246.72	80402	R$19,836,781.44
	-	-	-		-
Total (minimum)					R$ 289,960,561.28
Total (maximum)					R$ 863,520,918.65
Others /2019					
	UNIÃO QUIMICA	2mg 75cp	R$26.57		R$14,868,253.16
Biperiden	BAGÓ	4mg 30cp	R$24.72	559588	R$13,833,015.36
	-	-	-		-
	SANOFI	6.5mg 30cp	R$57.12		R$843,462,023.04
Zolpidem	UNIÃO QUIMICA	10mg 30cp	R$38.92	14766492	R$574,711,868.64
	SANOFI	12.5mg 30cp	R$114.24		R$1,686,924,046.08
	LIBBS	5mg 20cp	R$27.95		R$18,190,614.65
Buspirone	LIBBS	10mg 20cp	R$50.14	650827	R$32,632,465.78
	-	-	-		-
	TEUTO	25mg 20cp	R$8.73		R$1,257.12
Promethazine	CRISTALIA	25mg/ml 25amp 2mg	R$84.98	144	R$12,237.12
	-	-	-		-
	CRISTALIA	5mg 20cp	R$17.92		R$4,370,168.32
Methadone	CRISTALIA	10mg 20cp	R$34.05	243871	R$8,303,807.55
	CRISTALIA	10mg/ml 10 amp 1ml	R$60.45		R$14,742,001.95
	UNIÃO QUIMICA	50mg 30cp	R$132.27		R$17,153,038.14
Naltrexone	-	-	-	129682	-
	-	-	-		-
Total (minimum)					R$ 898,045,354.43
Total (maximum)					R$ 1,765,296,804.43
Total of all classes in 2019 (minimum)					**R$ 6,879,488,081.96**
Total of all classes in 2019 (maximum)					**R$ 25,079,099,707.86**
Antidepressants/2020					
	CRISTALIA	10mg 30cp	R$13.33		R$105,797,743.95
Amitriptyline	GERMED	25mg 30cp	R$26.40	7936815	R$209,531,916.00
	NOVA QUIMICA	75mg 30cp	R$63.56		R$504,463,961.40
	EMS	10mg 20cp	R$11.93		R$15,745,046.98
Clomipramine	EMS	25mg 20cp	R$26.53	1319786	R$35,013,922.58
	NOVARTIS	75mg 20cp	R$89.50		R$118,120,847.00
	ASPEN PHARMA	10mg 20cp	R$12.14		R$2,833,063.24
Imipramine (hydrochloride)	NOVARTIS	75mg 30cp	R$66.70	233366	R$15,565,512.20
	NOVARTIS	150mg 30cp	R$116.82		R$27,261,816.12
	ASPEN PHARMA	10mg 20cp	R$12.14		R$2,136.64
Imipramine (pamoate)	ASPEN PHARMA	25mg 20cp	R$14.78	176	R$2,601.28
	NOVARTIS	75mg 30cp	R$66.70		R$11,739.20
	CELLERA	10mg 30cp	R$28.58		R$98,946,903.74
Nortriptyline	RANBAXY	50mg 30cp	R$42.26	3462103	R$146,308,472.78
	RANBAXY	75mg 30cp	R$57.14		R$197,824,565.42
	ACTAVIS	20mg 28cp	R$60.81		R$281,145,062.16
Citalopram	MEDLEY	20mg 30cp	R$67.88	4623336	R$313,832,047.68
	LIBBS	40mg 28cp	R$130.82		R$604,824,815.52
	SANDOZ	10mg 30cp	R$65.62		R$928,030,981.24
Escitalopram (oxalate)	UNIÃO QUIMICA	15mg 30cp	R$85.82	14142502	R$1,213,709,521.64
	SANDOZ	20mg 30cp	R$101.13		R$1,430,231,227.26
	EUROFARMA	10mg 28cp	R$28.75		R$205,833,152.50
Fuoxetine	GLOBO	20mg 30cp	R$29.54	7159414	R$211,489,089.56
	VITAMEDIC	20mg 60cp	R$33.10		R$236,976,603.40
Fuvoxamine	ABBOTT	50mg 30cp	R$78.51	493270	R$38,726,627.70

	ABBOTT	50mg 30cp	R$124.16		R$61,244,403.20
	ABBOTT	100mg 60cp	R$289.39		R$142,747,405.30
Paroxetine	SANDOZ	20mg 30cp	R$54.80	6094042	R$333,953,501.60
	EUROFARMA	25mg 20cp	R$101.84		R$620,617,237.28
	EUROFARMA	30mg 3x10cp	R$228.99		R$1,395,474,677.58
Sertraline	MOMENTA	25mg 30cp	R$49.20	14572986	R$716,990,911.20
	AUROBINDO	50mg 30cp	R$57.45		R$837,218,045.70
	BIOSINTETICA	75mg 30cp	R$358.91		R$5,230,390,405.26
Bupropion	NOVA QUIMICA	150mg 30cp	R$69.66	2707063	R$188,574,008.58
	NOVA QUIMICA	150mg 60cp	R$144.63		R$391,522,521.69
	NOVA QUIMICA	300mg 60	R$721.29		R$1,952,577,471.27
Desvenlafaxine	MEDLEY	50mg 30cp	R$111.15	8200801	R$911,519,031.15
	MEDLEY	100mg 30cp	R$122.36		R$1,003,450,010.36
	-	-	-		-
Duloxetine	EMS	30mg 7cp	R$35.89	4737113	R$170,014,985.57
	EMS	30mg 30cp	R$231.13		R$1,094,888,927.69
	EMS	60MG 60CP	R$940.27		R$4,454,165,240.51
Mirtazapine	EMS	15mg 30cp	R$87.98	2397063	R$210,893,602.74
	EMS	30mg 30cp	R$176.03		R$421,954,999.89
	EMS	45mg 30cp	R$250.26		R$599,888,986.38
Trazodone	TORRENT	50mg 30 cp	R$29.06	3049078	R$88,606,206.68
	TORRENT	100mg 30cp	R$58.24		R$177,578,302.72
	APSEN	150mg 30 cp	R$134.54		R$410,222,954.12
Venlafaxine (hydrochloride)	EUROFARMA	37.5mg 30cp	R$35.47	6744973	R$239,244,192.31
	EUROFARMA	75mg 30cp	R$83.10		R$560,507,256.30
	MEDLEY	150mg 30cp	R$98.28		R$662,895,946.44
Agomelatine	EMS	25mg 15cp	R$71.19	126740	R$9,022,620.60
	EMS	25mg 30cp	R$142.38		R$18,045,241.20
	EMS	25MG 60cp	R$284.75		R$36,089,215.00
Vortioxetine	LUNDBECK	5mg 30cp	R$203.78	327932	R$66,825,982.96
	LUNDBECK	10mg 30cp / 5mg 60cp	R$407.59		R$133,661,803.88
	LUNDBECK	10mg 60cp	R$815.22		R$267,336,725.04
Tranylcypromine	GLAXOSMITHKLINE	10mg 20cp	R$34.42	40231	R$1,384,751.02
	-	-	-		-
	-	-	-		-
Total (minimum)					R$ 4,614,090,512.56
Total (maximum)					R$ 19,276,339,363.60
Antipsychotics/2020					
Chlorpromazine	SANOFI	25mg 20cp	R$7.09	1546085	R$10,961,742.65
	SANOFI	100mg 20cp	R$10.60		R$16,388,501.00
	-	-	-		-
Fluphenazine	CRISTALIA	5mg 200	R$48.83	204	R$9,961.32
	-	-	-		-
	-	-	-		-
Haloperidol	JANSSEN-CILAG	1mg 20cp	R$6.39	1892759	R$12,094,730.01
	PRATI DONADUZZI	2mg/ml 1 frasco	R$8.96		R$16,959,120.64
	CRISTALIA	5mg 20cp	R$6.50		R$12,302,933.50
Pimozide	JANSSEN-CILAG	1mg 20cp	R$13.88	532	R$7,384.16
	JANSSEN-CILAG	4mg 20cp	R$23.93		R$12,730.76
	-	-	-		-
Thioridazine	UNIÃO QUIMICA	25mg 20cp	R$15.39	590611	R$9,089,503.29
	UNIÃO QUIMICA	50mg 20cp	R$18.50		R$10,926,303.50
	UNIÃO QUIMICA	100mg 20cp	R$33.75		R$19,933,121.25
Trifluoperazine	GLAXOSMITHKLINE	2mg 20cp	R$9.15	141692	R$1,296,481.80
	GLAXOSMITHKLINE	5mg 20cp	R$13.19		R$1,868,917.48
	-	-	-		-
Aripiprazole	SANDOZ	10mg 30cp	R$200.50	522897	R$104,840,848.50
	SANDOZ	20mg 30cp	R$625.76		R$327,208,026.72
	SANDOZ	30mg 30cp	R$1,023.71		R$535,294,887.87

	SUPERA FARMA	25mg 230cp	R$41.63		R$11,868,005.29
Clozapine	SUPERA FARMA	100mg 30cp	R$167.46	285083	R$47,739,999.18
	-	-	-		-
	SANOFI	2,5mg 30cp	R$61.63		R$84,926,817.93
Olanzapine	SANOFI	5mg 30cp	R$91.02	1378011	R$125,426,561.22
	SANOFI	10mg 30cp	R$182.04		R$250,853,122.44
	JANSSEN-CILAG	9mg 28cp	R$1,269.26		R$23,257,920.24
Paliperidone	JANSSEN-CILAG	6mg 28cp	R$818.07	18324	R$14,990,314.68
	JANSSEN-CILAG	3mg 28cp	R$408.97		R$7,493,966.28
	CRISTALIA	50mg 30cp	R$ 109.42		R$1,162,833,913.84
Quetiapine	EUROFARMA	100mg 30cp	R$120.08	10627252	R$1,276,120,420.16
	EUROFARMA	200mg 30cp	R$244.60		R$2,599,425,839.20
	SANDOZ	1mg 30cp	R$31.60		R$229,403,581.20
Risperidone	SANDOZ	2mg 30cp	R$31.60	7259607	R$229,403,581.20
	SANDOZ	3mg 30cp	R$31.60		R$229,403,581.20
	-	-	-		-
Ziprasidone	EMS	40mg 30cp	R$298.87	8653	R$2,586,122.11
	EMS	80mg 30cp	R$497.46		R$4,304,521.38
Total (minimum)					R$ 1,653,177,012.34
Total (maximum)					R$ 3,725,032,082.86
Benzodiazepines/2020					
	EMS	0.5mg 30cp	R$11.06		R$147,741,913.20
Alprazolam	EMS	1mg 30cp	R$21.65	13358220	R$289,205,463.00
	MEDLEY	2mg 30cp	R$63.19		R$844,105,921.80
	ROCHE	0.25mg 30cp	R$6.88		R$158,966,507.36
Clonazepam	GEOLAB	0.5mg 30cp	R$8.46	23105597	R$195,473,350.62
	ZYDUS	2mg 30cp	R$13.89		R$320,936,742.33
	VALEANT	12.5mg + 5mg 20	R$10.89		R$7,547,270.94
Chlordiazepoxide	-	-	-	693046	-
	-	-	-		-
	NEO QUIMICA	5mg 30cp	R$11.27		R$33,330,055.78
Diazepam	NEO QUIMICA	10mg 30cp	R$15.23	2957414	R$45,041,415.22
	-	-	-		-
	WYETH	1mg 30cp	R$26.36		R$59,701,182.40
Lorazepam	LEGRAND PHARMA	2mg 30cp	R$19.77	2264840	R$44,775,886.80
	-	-	-		-
	ROCHE	7.5mg 3x10cp	R$52.51		R$17,096,205.80
Midazolam	CRISTALIA	15mg 20cp	R$61.95	325580	R$20,169,681.00
	-	-	-		-
Total (minimum)					R$ 424,383,135.48
Total (maximum)					R$ 1,282,576,918.09
Mood stabilizers/2020					
	BIOLAB SANUS	250mg 25cp	R$15.54		R$84,205,416.96
Valproic Acid	ABBOTT	250mg 50cp	R$47.80	5418624	R$259,010,227.20
	SANOFI	500mg 40cp	R$42.00		R$227,582,208.00
	TEUTO	200mg 30cp	R$17.61		R$87,704,755.95
Carbamazepine	TEUTO	400mg 30cp	R$35.32	4980395	R$175,907,551.40
	-	-	-		-
	SUPERA FARMA	300mg 25cp	R$19.02		R$57,695,781.54
Lithium	ACTAVIS	300mg 50cp	R$24.68	3033427	R$74,864,978.36
	SUPERA FARMA	450mg 30cp	R$54.83		R$166,322,802.41
	ALTHAIA	25mg 30cp	R$23.71		R$70,433,115.68
Lamotrigine	ALTHAIA	50mg 30cp	R$38.74	2970608	R$115,081,353.92
	ALTHAIA	100mg 30cp	R$65.24		R$193,802,465.92
Total (minimum)					R$ 300,039,070.13
Total (maximum)					R$ 763,615,027.73
Dopaminergic or adrenergic agonists /2020					
	EMS	10mg 30cp	R$25.72		R$39,785,213.48
Methylphenidate	NOVARTIS	20mg 30cp	R$268.86	1546859	R$415,888,510.74
	NOVARTIS	30mg 30cp	R$282.30		R$436,678,295.70

	SHIRE	30mg 28cp	R$358.42		R$511,627,704.26
Lisdexamfetamine	SHIRE	50mg 28cp	R$434.63	1427453	R$620,413,897.39
	SHIRE	70mg 28cp	R$434.63		R$620,413,897.39
	LIBBS	100mg 30cp	R$123.37		R$8,362,265.34
Modafinil	LIBBS	200mg 30cp	R$246.72	67782	R$16,723,175.04
	-	-	-		-
Total (minimum)					R$ 559,775,183.08
Total (maximum)					R$ 1,073,815,368.13
Others /2020					
	UNIÃO QUIMICA	2mg 75cp	R$26.57		R$36,064,709.79
Biperiden	BAGÓ	4mg 30cp	R$24.72	1357347	R$33,553,617.84
	-	-	-		-
	SANOFI	6.25mg 20cp	R$38.07		R$553,508,752.59
Zolpidem	UNIÃO QUIMICA	10mg 30cp	R$38.92	14539237	R$565,867,104.04
	SANOFI	12.5mg 20cp	R$76.14		R$1,107,017,505.18
	LIBBS	5mg 20cp	R$27.95		R$22,525,855.30
Buspirone	LIBBS	10mg 20cp	R$50.14	805934	R$40,409,530.76
	-	-	-		-
	TEUTO	25mg 20cp	R$8.74		R$3,399.86
Promethazine	CRISTALIA	25mg/ml 25amp 2mg	R$84.98	389	R$33,057.22
	-	-	-		-
	CRISTALIA	5mg 20cp	R$17.92		R$4,528,437.76
Methadone	CRISTALIA	10mg 20cp	R$34.05	252703	R$8,604,537.15
	CRISTALIA	10mg/ml 10 amp 1ml	R$60.45		R$15,275,896.35
	UNIÃO QUÍMICA	50mg 30cp	R$132.26		R$25,024,385.56
Naltrexone	-	-	-	189206	-
		-	-		-
Total (minimum)					R$ 641,655,540.86
Total (maximum)					R$ 1,221,313,992.91
Total of all classes in 2020 (minimum)					**R$ 8,193,120,454.45**
Total of all classes in 2020 (maximum)					**R$ 27,342,692,753.32**

Table S3. Hospitalizations per 100,000 adult inhabitants due to mood disorders, and schizophrenia, schizotypal, and delusional disorders

Year	Hospitalizations/100,000 inhabitants	
	Mood disorders	***Schizophrenia, schizotypal and delusional disorders***
2015	31.0	51.5
2016	30.2	47.0
2017	31.3	45.1

2018	32.9	45.2
2019	35.8	46.8
2020	30.0	39.0
2021	30.2	40.2
2022	33.3	42.7
2023	37.6	45.5

Data from DataSUS (http://tabnet.datasus.gov.br/cgi). Adults are considered 20 years of age or older.