

Hospitalizations due to alcohol and other drugs: trends in a decade in the state of Paraná

Internações por álcool e outras drogas: tendências em uma década no estado do Paraná
Internaciones por alcohol y otras drogas: tendencias de una década en el estado de Paraná

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Abstract

Objective: To analyze the trend of hospitalizations due to alcohol and other drugs in a decade in the state of Paraná.

Methods: This is an ecological, time series study using the Unified Health System's Hospital Information System. Data were collected from the records of the state of Paraná, southern Brazil, restricted to the period from 2009 to 2018. Diagnostic criteria F10 to F19 (use of alcohol and other drugs) records were sought, according to the International Statistical Classification of Diseases and Related Health Problems – 10th edition. For trend analysis, the polynomial regression model was used.

Results: There were 201,377 hospitalizations for mental and behavioral disorders due to the use of alcohol and other drugs, with a mean rate of 210.52 hospitalizations per 100,000 inhabitants. There was a higher male hospitalization rate, with a mean of 374.24 per 100,000 inhabitants, predominantly aged 25 to 50 years for both sexes. Among hospitalizations, 56.86% were related to mental and behavioral disorders due to alcohol use. Polynomial regression analysis revealed downward trend ($p=0.003$; $R^2=0.706$), with differences between the state regions. The East Macroregion had the highest hospitalization rate (320.25), only the Paranaguá region had an upward trend (19.33/year).

Conclusion: The rate of hospitalizations showed a decline and the identification of the regions with the highest rate of hospitalization due to alcohol and other drug abuse can provide subsidies for implementing public policies, with monitoring actions and prevention strategies.

Resumo

Objetivo: Analisar a tendência das internações hospitalares por álcool e outras drogas em uma década no estado do Paraná.

Métodos: Estudo ecológico, de série temporal, utilizando o Sistema de Informações Hospitalares do Sistema Único de Saúde. Os dados foram coletados dos registros do estado do Paraná, Região Sul do Brasil, restritos ao período de 2009 a 2018. Buscaram-se registros dos critérios diagnósticos F10 a F19 (uso de álcool e outras drogas), de acordo com a Classificação Estatística Internacional de Doenças e Problemas Relacionados com a Saúde – 10^a edição. Para a análise de tendência, utilizou-se o modelo de regressão polinomial.

Resultados: Foram registradas 201.377 internações hospitalares por transtornos mentais e comportamentais devido ao uso de álcool e outras drogas, com taxa média de 210,52 internações por 100 mil habitantes. Houve maior taxa de internação do sexo masculino, média 374,24 por 100 mil habitantes, predomínio a faixa etária dos 25 a 50 anos para ambos os sexos. Dentre as internações, 56,86% estavam relacionadas a transtornos mentais e comportamentais devido ao uso de álcool. A análise da regressão polinomial revelou

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tendência decrescente ($p=0,003$; $R^2=0,706$), com diferenças entre as regiões do Estado. A Macrorregional Leste apresentou a maior taxa de internação (320,25), apenas a regional de Paranaguá apresentou tendência crescente (19,33/ano).

Conclusão: A taxa das internações apresentou um declínio e a identificação das regiões com maior taxa de internação por abuso de álcool e outras drogas pode fornecer subsídios para a implementação de políticas públicas, com ações de monitoramento e estratégias de prevenção.

Resumen

Objetivo: Analizar la tendencia de las internaciones hospitalarias por alcohol y otras drogas de una década en el estado de Paraná.

Métodos: Estudio ecológico, de serie temporal, utilizando el Sistema de Información Hospitalaria del Sistema Único de Salud. Los datos fueron recopilados de los registros del estado de Paraná, región sur de Brasil, restringidos al período de 2009 a 2018. Se buscaron registros de los criterios diagnósticos F10 a F19 (uso de alcohol y otras drogas), de acuerdo con la Clasificación Estadística Internacional de Enfermedades y Problemas Relacionados con la Salud – 10ª edición. Para el análisis de tendencia, se utilizó el modelo de regresión polinomial.

Resultados: Se registraron 201.377 internaciones hospitalarias por trastornos mentales y comportamentales en función del uso de alcohol y de otras drogas, con un índice promedio de 210,52 internaciones cada 100.000 habitantes. Hubo un índice más alto de internación del sexo masculino, promedio 374,24 cada 100.000 habitantes, predominio del grupo de edad de 25 a 50 años en ambos sexos. El 56,86 % de las internaciones se relacionó con trastornos mentales y de comportamiento en función del uso de alcohol. El análisis de la regresión polinomial reveló una tendencia decreciente ($p=0,003$; $R^2=0,706$), con diferencias entre las regiones del estado. La Macrorregional Este presentó el índice más elevado de internación (320,25), solamente la regional de Paranaguá presentó una tendencia creciente (19,33/año).

Conclusión: El índice de las internaciones mostró una caída y la identificación de las regiones con mayor índice de internación por abuso de alcohol y otras drogas puede respaldar la implementación de políticas públicas, con acciones de monitoreo y de estrategias de prevención.

Introduction

Considered a serious social concern worldwide and of public health, the problematic use of alcohol and other drugs is a risk factor for hospitalizations. It involves biological, psychological, social, cultural, political and economic dimensions, constituting a challenge for managers, in the process of implementing public policies and in actions to strengthen the Psychosocial Care Network.^(1,2)

It is estimated that 70% of the world population consume alcoholic beverages, 271 million people are users of alcohol and other drugs, and 5.5% of the world population between 15 and 64 years of age used alcohol and other drugs in 2016. The estimate of mental disorders associated with alcohol and other drug abuse reaches 35 million people.^(3,4) In Brazil, the prevalence of alcohol abuse was 30.1% in 2015, accounting for approximately 46 million inhabitants. The prevalence of binge drinking was 16.5%, corresponding to approximately 25 million Brazilians.^(5,6)

Alcohol and other drug consumption represents a risk factor for adverse health events, represented by primary complications, such as traumatic injuries and acute poisoning, and secondary complications, such as chronic non-communicable diseases and social problems, especially for the homeless. Acute, chronic and chronic aggravations cause health care in Primary and Specialized Care, in emergency services and in hospital services.^(7,8)

Alcohol and other drug users generally access health services through the Emergency Network, due to clinical and traumatic (physical and psychological) consequences and complications associated with compulsive consumption and worsening of the condition, being referred for observation or hospitalization. It may result in the overload of the Unified Health System (SUS - *Sistema Único de Saúde*), especially in Emergency Care Units. Knowing the profile of hospitalized patients is important for planning strategies to face this reality.^(5,9)

Considering that no studies were identified on the rate and distribution of hospitalizations due to the effects of alcohol and other drugs in the state of Paraná, it is justified to conduct a study on the distribution and trend of hospitalizations in the state. As it is a complex and multifactorial problem, the approach to the theme is relevant and necessary to subsidize the elaboration and implementation of improvements in public policies, according to local and macroregional specificities.

The objective of this study was to analyze the trend of hospitalizations due to alcohol and other drugs in a decade in the state of Paraná.

Methods

This is an ecological study, of time series, referring to hospitalizations due to alcohol and other drugs in the state of Paraná, from 2009 to 2018.

At the time of this research, the state of Paraná had 11,516,840 million inhabitants, 50.7% of the female population. It had 399 municipalities structured in 52 microregions, 22 health region and four health macroregions. Each health macroregion has demographic, socioeconomic, political characteristics and a diverse number of health regions. Regionalization is a SUS guideline and, at the same time, a structuring axis of the management pact, with the provision of guiding the decentralization of actions and health services, in addition to enabling the process of negotiation and agreement between managers.⁽¹⁰⁾

We analyzed the records of hospitalizations due to alcohol and other drugs available in the SUS Hospital Information System (HIS), which were processed by the SUS Department of Informatics (DATASUS) in general and specialized hospitals in the state of Paraná. Data were filtered using the International Statistical Classification of Diseases and Related Health Problems – 10th edition (ICD-10), selecting only hospitalizations with primary diagnosis related to disease coding groups F10 to F19, which describe the categories of mental and behavioral disorders due to the use of alcohol and other drugs.

Data collection was conducted in 2012. To choose the period, it was chosen for the last ten years at the time of collection, since it is an appropriate time for trend analysis. Moreover, it was considered that the last decade analysis would allow a comparison with more reliable data to socioeconomic reality of the most current hospitalizations.

To perform the trend analysis, variables were selected: sex (male or female); age (young: 13 to 24 years old; adults: 25 to 59 years old; older adult: 60 years old or more); hospitalization diagnosis according to the ICD-10 classification; and place of residence according to macroregion and health region.

All analyses were performed with the aid of R, version 3.5. To assess the trend in hospital admission rates per 100,000 inhabitants, polynomial regression models were adjusted, considering the moving mean centered on a term of hospitalization rates as a dependent variable (Y) and years of schooling as an

independent variable (X). The models were adjusted considering both the general time series, as well as by sex, ICD-10, health macroregion and region.

For each of the assessed series, at first, the simple linear regression model ($y = \beta_0 + \beta_1 X$) and, later, the second-order model ($y = \beta_0 + \beta_1 X + \beta_2 X^2$) were tested, choosing the model that presented the highest value for the coefficient of determination (R^2 or R^2 adjusted, for second-order models). The presence of trend was assessed through the significance of the best adjusted model, and the direction was determined by the regression coefficients obtained, in cases where the second-order model proved to be more adequate, the trend could invert its direction over the period, if the maximum or minimum point of the parabola (depending on the concavity) was within the assessed interval.

Residual normality was assessed using the Shapiro-Wilk test, and the normality hypothesis was not rejected in any of the models. The same approach was also used to assess the trend of the series of the mean length of stay and the death rate per 100,000 admissions.

By using secondary and aggregated data, publicly accessible, available on the DATASUS website, there was no need for assessment by Research Ethics Committee.

Results

From 2009 to 2018, 8,025,523 hospital admissions were recorded in the state of Paraná, of which 201,377 (2.5%) were related to the groups of mental and behavioral disorders due to the use of alcohol and other drugs, classified in F10 to F19 according to the ICD-10. The mean rate of hospitalization due to alcohol and other drugs in the state was 210.52 hospitalizations per 100,000 inhabitants, with a downward trend (mean reduction of -7.0 per year; $R^2=0.706$) (Table 1).

Hospitalizations were more prevalent in male patients (88.61%), with a mean rate of 374.24 per 100,000 inhabitants and downward trend (-12.63 per year; $p=0.001$). For females, the mean rate was 49.72 per 100,000 inhabitants, with a constant

Table 1. Trend of hospitalization rates (per 100,000 inhabitants) due to alcohol or other drugs according to sex, age and hospitalization diagnosis

General calculation	Model	R ²	p-value	Trend
General/age	$y=210.52-7.0x$	0.706	0.003	↓
13-24 years	$y=4376.44-231.67x$	0.615	0.008	↓
25-59 years	$y=2139.15-1371.81x+71.64x^2$	0.716	0.010	↓
60 years and older	$y=898.30+18.12x+3.5x^2$	0.807	0.003	↓/↑
Sex/age				
Female	$y=49.72-1.4x$	0.305	0.071	–
13-24 years	$y=985.85-65.14x$	0.494	0.021	↓
25-59 years	$y=1898.39+120.63x+10.37x^2$	0.164	0.247	↓/↑
60 years and older	$y=100.65+17.63x+1.73x^2$	0.909	0.000	↓/↑
Male	$y=374.24-12.63x$	0.754	0.001	↓
13-24 years	$y=3390.59+166.53x$	0.657	0.005	↓
25-59 years	$y=19491.75+1251.18x+61.27x^2$	0.761	0.006	↓
60 years and older	$y=745.64+20.79x$	0.002	0.002	↓/↑
ICD-10				
F10 (alcohol)	$y=147.76-9.36x+0.3x^2$	0.914	<0.001	↓
F11 (opioids)	$y=0.56-0.02x$	0.648	0.005	↓
F12 (cannabis)	$y=0.89-0.09x+0.02x^2$	0.869	0.001	↓/↑
F13 (sedatives/hypnotics)	$y=0.32-0.04x+0x^2$	0.865	0.001	↓/↑
F14 (cocaine/crack)	$y=24.94-1.75x$	0.800	0.001	↓
F15 (stimulants)	$y=0.1+0.0x$	0.377	0.046	↓
F16 (hallucinogens)	$y=1.89-0.39x+0.02x^2$	0.834	0.002	↓/↑
F17 (smoking)	$y=0.4-0.1x+0.01x^2$	0.958	<0.001	↓/↑
F18 (volatile solvents)	$y=0.01+0.06x-0.01x^2$	0.576	0.032	↑/↓
F19 (polysubstance drugs)	$y=75.97-5.09x+0.4x^2$	0.096	0.555	–

↓ downward; ↑ upward; ↓/↑ downward/upward; – constant

trend ($p=0.071$). There was a predominance of hospitalizations in adults aged 25 to 59 years (80.4%). Among hospitalizations, 56.86% were related to mental and behavioral disorders due to alcohol use, and the mean rate of alcohol use was 147.76 per 100,000 inhabitants, but with a downward trend (reduction of 9.36 per year). Still in relation to the ICD-10 classification, only hospitalizations due to polysubstance drugs (F19) showed no significant trend ($p=0.555$).

In Figure 1, the mean annual rates of hospitalizations due to alcohol or other drugs are presented, according to sex and the 22 health region units of Paraná. Regarding the spatial distribution of the mean annual rates, state rates were higher for males and higher in the health regions located in north-western Paraná, with a predominance in Paranavaí and Apucarana, and in eastern Paraná, with emphasis on Curitiba and União da Vitória. For the graphical presentation of hospitalization rates due to alcohol or other drugs (per 100 thousand inhabitants) among the health region, a gradient scale was

used in blue, and the darker the color, the higher the health region rate, considering the mean of two different periods, 2009 to 2013 and 2014 to 2018, for females, males and general.

The mean rates from 2014 to 2018 were lower for 15 health regions compared to 2009 to 2013. The decrease in the mean rate was greater than 100 cases per 100 thousand inhabitants between the two periods for the health regions of Irati and Maringá, but there was an increase of more than 30 cases per 100 thousand inhabitants in the regions of Paranaguá and União da Vitória. Considering the health macroregions, in the East and West macroregions, the trend started downward and became upward in 2018 and 2015, respectively, while the northwest macroregion trend was downward throughout the entire period and the north macroregion trend started upward in 2013, followed by a fall (Figure 2).

In the trend analysis of hospitalization rates due to alcohol and/or drugs, according to the macroregions and health region of Paraná, the East macroregion had the highest mean hospitalization rate (320.25), and the Paranaguá Health region had an upward trend (mean increase of 19.33 per year), but with the lowest mean hospitalization rate (68.61) (Table 2).

Assessing the results of the models for the 22 health regions, it appears that, for ten of them, the trend was not significant (Pato Branco, Foz do Iguaçu, Campo Mourão, Umuarama, Paranavaí, Apucarana, Londrina, Cornélio Procópio, Telemaco Borba and Ivaiporã). For three regions, the trend was downward throughout the period (Curitiba, Guarapuava and Maringá), and, for the health region of Paranaguá, the trend was upward. Patients remained hospitalized for a mean of 18 days. The mean of hospital length of stay showed a trend of decline over this period (-0.14 ; $p<0.001$), with a mean reduction of 0.14 days per year in hospital length of stay. As an outcome of hospitalization, 141 deaths (0.07%) were recorded, which represents a rate of 70.02 deaths per 100,000 hospitalizations. There was no evidence that the trend was significant over the period assessed ($p=0.486$) (Table 3).

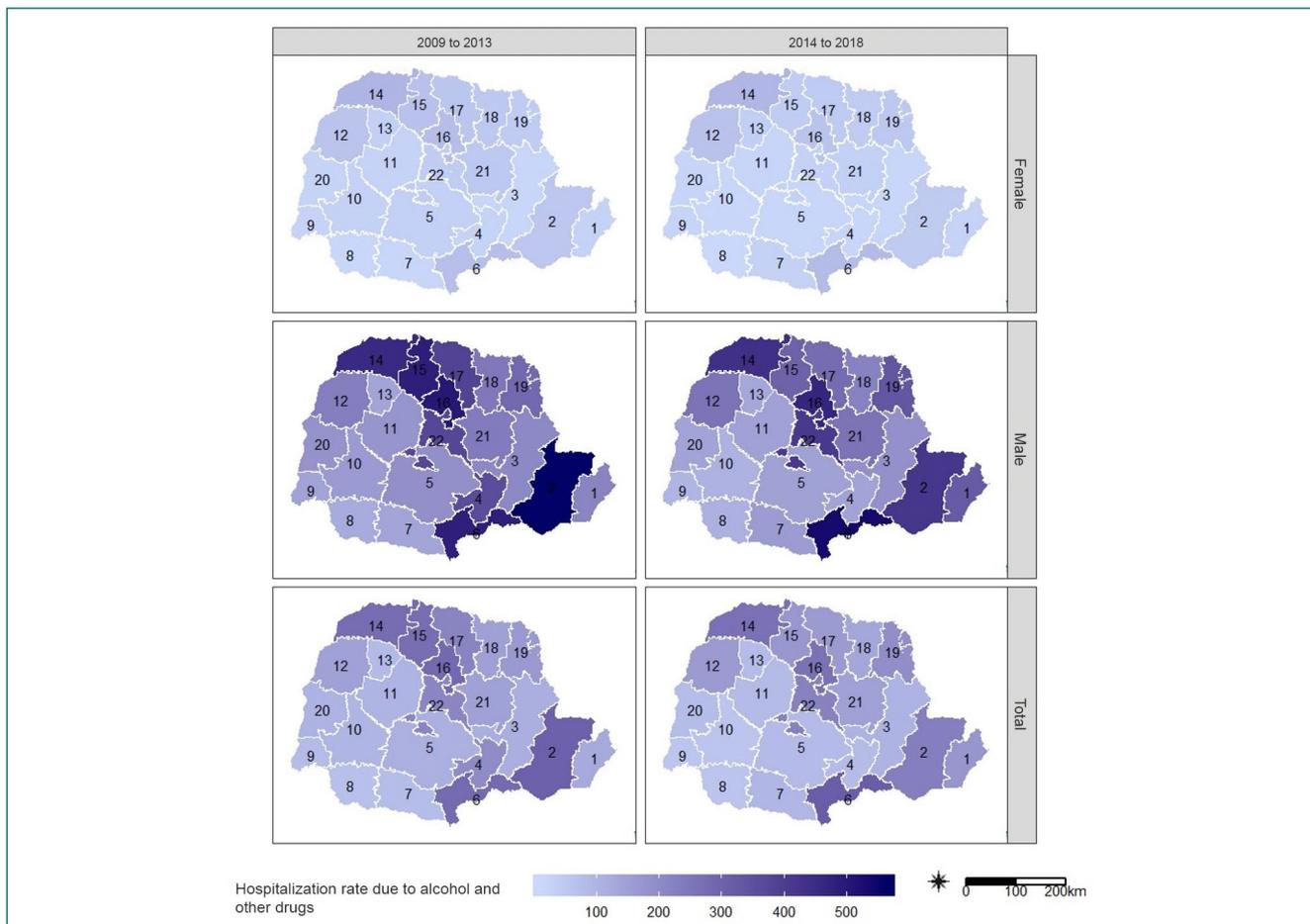
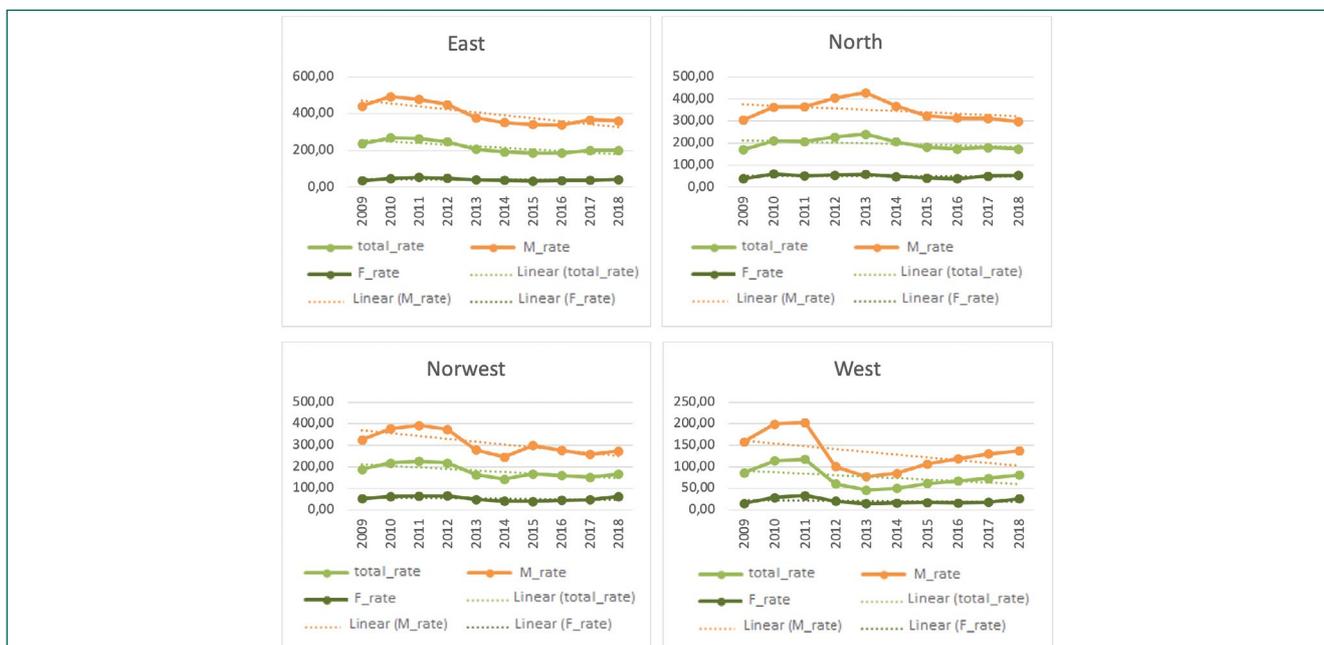


Figure 1. Distribution of mean annual hospitalization rates (per 100,000 inhabitants) due to alcohol or other drugs, according to health region and sex



F - female; M - male

Figure 2. Rate of hospitalizations due to alcohol and other drugs and respective trend models according to sex and health macroregion

Table 2. Trend in hospitalization rates (per 100,000 inhabitants) due to alcohol or other drugs by macroregion and health region of Paraná

Macroregion and health region	Model	R ²	p-value	Trend
East	$y=320.25-26.83x+1.39x^2$	0.765	0.005	↓/↑
1 st - Paranaguá	$y=68.61+19.33x-0.9x^2$	0.689	0.013	↑
2 nd - Curitiba	$y=397.31-32.05x+1.44x^2$	0.863	0.001	↓
3 rd - Ponta Grossa	$y=196.52-35.8x+2.88x^2$	0.517	0.048	↓/↑
4 th - Irati	$y=367.58-62.77x+3.35x^2$	0.880	0.001	↓/↑
5 th - Guarapuava	$y=123.17-4.7x$	0.741	0.002	↓
6 th - União da Vitória	$y=135.2+57.09x-4.18x^2$	0.549	0.039	↑/↓
7 th - Pato Branco	$y=146.12-29.21x+2.68x^2$	0.367	0.107	-
21 st - Telêmaco Borba	$y=236.28-39.69x+3.35x^2$	0.353	0.114	-
West	$y=172.83-33.4x+2.4x^2$	0.632	0.021	↓/↑
8 th - Francisco Beltrão	$y=149.86-32x+2.42x^2$	0.557	0.037	↓/↑
9 th - Foz do Iguaçu	$y=90.21-3.78x$	0.256	0.094	-
10 th - Cascavel	$y=185.34-32.95x+2.07x^2$	0.821	0.002	↓/↑
20 th - Toledo	$y=281.43-68.91x+5.14x^2$	0.633	0.021	↓/↑
Northwest	$y=233.51-8.81x$	0.626	0.007	↓
11 th - Campo Mourão	$y=148.64-19.52x+1.37x^2$	0.393	0.094	-
12 th - Umuarama	$y=176.97-13.49x+1.25x^2$	0.472	0.062	-
13 th - Cianorte	$y=149.38-28.58x+2.36x^2$	0.706	0.011	↓/↑
14 th - Paranavaí	$y=284.25-2.43x$	0.049	0.455	-
15 th - Maringá	$y=335.45-19.18x$	0.799	0.001	↓
North	$y=165.51+20.59x-2.09x^2$	0.556	0.037	↑/↓
16 th - Apucarana	$y=273.3+6.13x-0.89x^2$	0.363	0.109	-
17 th - Londrina	$y=168.97+21.32x-2.51x^2$	0.473	0.062	-
18 th - Cornélio Procopio	$y=78.85+30.8x-2.89x^2$	0.506	0.051	-
19 th - Jacarezinho	$y=112.27+19.85x-1.19x^2$	0.887	0.001	↑/↓
22 nd - Ivaiporã	$y=123.09+36.17x-2.87x^2$	0.495	0.054	-

↓ downward; ↑ upward; ↓/↑ downward/upward; - constant

Table 3. Trend in mean hospital length of stay and death rate (per 100,000 hospitalizations) due to alcohol or other drugs

	Model	R ²	p-value	Trend
Mean hospital length of stay	$y=18,74-0,14x-0,01x^2$	0.952	<0.001	↓
Death rate	$y=61.89+1.4x$	0.055	0.486	-

↓ downward; - constant

Discussion

In Brazil, from 2000 to 2014, 1,549,298 hospitalizations due to mental and/or behavioral disorders were registered in SUS hospital services, with a predominance of males (64.5%), mean hospital stay of 29 days, and an incidence of 39.4% related to ICD-10 - F10-F19 Mental and behavioral disorders due to psychoactive substance use diagnoses.⁽¹¹⁾

The state of Paraná presented a hospitalization rate due to alcohol and other drugs abuse lower than the national rate (217.76 per 100 thousand inhabitants).⁽¹²⁾ Although the rate of hospitalization due to alcohol and other drugs has dropped, it still remains high, signaling the need for preventive actions and assistance aimed at these cases.

Analysis of hospitalization rates due to alcohol and other drug abuse in the state of Paraná showed downward values in all macroregions and growth variations in 2013 for the North macroregion, with a subsequent decline in 2015 for the West macroregion, and in 2018 for the East – all maintained growth until 2018.

In the state of Santa Catarina, a mean of 221.41 hospitalizations per year was observed for every 100 thousand inhabitants, in the distribution of hospitalizations according to the macroregions of patients' residence. Most hospitalizations were recorded among residents of the state capital region and with similar data between urban and rural areas, with a predominance of alcohol use, corroborating data found in this study.⁽¹³⁾

The characteristics of sex and age of users of alcohol and other drugs who were hospitalized during the study period do not necessarily portray the drug-using population profile.^(4,5) The diversity in cultural and socioeconomic conditions should be considered, which makes some seek health services and others not.^(14,15) However, the rates and trends presented provide a view of current scenario of hospitalizations due to alcohol and other drugs according to basic demographic variables.

According to the III National Survey on Drug Use in the Brazilian Population, approximately 3.3 million individuals over the age of 12 met criteria for dependence on alcohol or other drugs, except tobacco. The age groups with the highest incidence of alcohol consumption were 25 to 34 years old (38.2%), 18 to 24 years old (35.1%) and 35 to 44 years old (34.6%). The highest proportion of lifetime consumption was in males (74.3%), compared to 59.0% in females.⁽⁵⁾

The Brazilian National Health Survey, with data collected in 2019 on alcohol consumption and other health parameters of the Brazilian adult population, indicated that, compared to 2013, there was an increase in weekly alcohol consumption in 2019 (from 23.9% to 26%). This factor was mainly driven by women, whose indicator went from 12.9% to 17%, that is, an increase of 4.1 percentage points in weekly alcohol consumption.⁽⁶⁾

The indicators studied showed that the state of Paraná, as well as the rest of the country, had

88.61% of beds for the treatment of complications from alcohol and other drug abuse predominantly occupied by men. On the other hand, the trend in the rate for men was significantly downward over the period assessed. This result was a consequence of the high prevalence of alcohol and drug use by males, who present behaviors in the public domain, and for women, in the private domain. However, this difference has been decreasing over the years, associated with the greater participation of women in social life.^(13,16,17)

Recent studies have shown that the gender gap in relation to PAS consumption is no longer so present between adolescents (aged 12-17) and the elderly, where it has been shown that excessive alcohol consumption has increased more among women, with no similar increase in men over 60.⁽¹⁸⁾

Currently, women have been the fastest growing segment of users of psychoactive substances in the United States and worldwide,⁽¹⁹⁾ and this phenomenon of increase in the prevalence of women using alcohol or drugs has adverse health consequences, given the greater risk of women progressing rapidly to addictive behavior when compared to men. In this context, responses to drug use by women are complex, and it is necessary to recognize both the social and health costs, as well as the patterns and motivations among those who use substances. There is a wide range of substances in use, including alcohol, nicotine, cannabis, opioids, and methamphetamines, as well as the misuse of prescribed medications, which require health care.⁽²⁰⁾

The decline in hospitalizations in the decade studied may have been driven by legislation and strategies for the prevention and reduction of harm from alcoholic beverages and other drugs, such as the Prohibition Law and the *Programa Crack, é Possível Vencer*,^(21,22) in addition to legislation that redefines the care model, with the closing of large psychiatric hospitals and the redirection to extra-hospital care services, through the Psychosocial Care Network.⁽²³⁾ This change in scenario corroborates the Psychiatric Reform principles, according to which the consolidation of the territorial bases of care in mental health and drugs of abuse is proposed. Prevention, reception and treatment were

assigned to a health care network, which includes Primary Health Care.⁽²⁴⁾

The importance of strengthening the Psychosocial Care Network services through the CAPS ad III and CAPS ad IV, which provides care with a multidisciplinary team, 24 hours a day, every day of the week, to people with severe conditions and intense suffering resulting from the use of crack, alcohol and other drugs.⁽²⁵⁾

The implementation of Law 11,715, known as Lei Seca, was an important step towards the formation of more effective policies to combat drunk driving in Brazil, by imposing zero alcohol consumption and greater rigor in alcohol consumption by drivers.⁽²²⁾ However, Despite the measures instituted by the Brazilian government, recent studies showed that 24.3% of Brazilian drivers took over driving a motor vehicle after having consumed alcohol, and traffic violence remains one of the main causes of deaths in the country, occupying the second place of death from external causes.^(23,26,27)

In the analysis by health regions, the only one with upward trend was Paranaguá. This fact may be associated with its geographical location in the state, as it is a port city, with a greater circulation of drugs, several forms of access and high alcohol consumption by individuals who frequent the port.⁽²⁶⁾

Alcohol is the drug with the highest number of hospitalizations in all health regions. The ease of access to and consumption of alcoholic beverages, being a licit drug, is a precipitating factor of accidents (accidentogenic factor), violence and worsening of clinical diseases. The association with cannabinoids, cocaine and crack is very frequent.⁽¹³⁾

According to ICD-10, mental and behavioral disorders associated with the use of cannabis, sedatives and hypnotics, hallucinogens and smoking went from downward trend at the beginning of the period to upward at the end. Polysubstance drug use is an indicative factor of increased severity of injury and death.⁽¹⁶⁾ Social, cultural, and individual risk factors for drug polyuse are verified in literature.^(14,15)

The mean hospitalization rates were high. The severity of each case is a fundamental factor to define the length of hospitalization; however, this period is also associated with the detoxification process

and the treatment of abstinence and other ailments and injuries, associated with the direct and indirect effects related to the consumption of alcohol and other drugs.^(4,27)

The mean mortality rate was 70.02 deaths per 100,000 inhabitants. Longitudinal studies demonstrate that mortality rates of drug users are up to 15 times higher than in the general population – although it varies widely by population and environment.⁽²⁾

The dissemination of these data can help in the elaboration of a guideline for the hospital management policy in Paraná and of strategies for the prevention of diseases associated with hospitalizations, in addition to providing an overview of Paraná so that investments of adequate resources are carried out, according to the needs of each region.

This study presents some limitations that must be considered in the interpretation of results. The main one refers to the use of secondary databases, in which there is a possibility of variability in the completeness and reliability of information from the records of hospitalizations registered in the HIS/SUS, which may be indicative of underreporting. Secondary data do not allow detailed identification of the study population profile, and specific information related to hospitalization, such as place of referral and type (voluntary or involuntary).

We emphasize that the study portrays a regional scenario, presenting the reality of hospitalizations for mental and behavioral disorders due to the use of alcohol and other drugs, collaborating in the elaboration of actions to improve public policies and strategies to strengthen disease prevention and health promotion at the national level.

Conclusion

From the analysis of hospitalization rates, it was possible to identify a decline in the time series of hospitalizations due to alcohol and other drug abuse from 2009 to 2018 in the state of Paraná. Data show hospitalizations in adult males due to mental and behavioral disorders due to alcohol use. The need to strengthen and expand the Psychosocial Care Network services and the development of pre-

ventive strategies to face the abuse of alcohol and other drugs is highlighted with the young and adult male population in the state of Paraná, mainly in the East and Northwest macroregions. Such knowledge can support state public policy managers in the implementation of targeted and more effective strategies for the prevention of diseases that require hospitalization associated with drug use.

Collaborations

Santana CJ, Gavioli A, Oliveira RR and Oliveira MLF contributed to the study design, data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published.

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