

Expenditure on psychiatric hospitalizations in the State of São Paulo, Brazil: a descriptive ecological study, 2014 and 2019

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Abstract

Objective: To analyze expenditure on psychiatric hospitalizations in the State of São Paulo in 2014 and 2019. **Methods:** This was a descriptive ecological study, with analysis of data on psychiatric hospital admissions in the State of São Paulo, retrieved from the Hospital Information System. **Results:** 115,652 hospitalizations that occurred in 2014 and 79,355 that occurred in 2019 were analyzed (reduction of 31.38%). There were reductions in the amounts spent on psychiatric hospitalizations (-42.94%), in particular expenditure on urgency hospitalizations, on female patients (-46.46%), on people aged 15-49 years (-36.85%) and on those aged over 50 years (-51.54%). **Conclusion:** The reduction in expenditure on psychiatric hospitalizations and the reduction in their frequency provide elements for the assessment and allocation of resources for mental health care, within the scope of hospital admissions and use of community-based services.

Keywords: Hospital Costs; Health Expenditures; Mental Health; Hospitalization; Community Mental Health Centers; Ecological Studies.

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Introduction

Psychiatric hospitalization is a theme for important reflection and debate with regard to mental health, given that it raises discussion about the different approaches and opinions regarding health care for people with mental suffering and the expenditure implied in such care.

Looking at the hospitalization scenario in Brazil, psychiatric hospitalizations related to mental disorders and behaviors resulting from alcohol use accounted for expenditure of BRL 142 million in the period 2002 to 2004, accounting for 83% of total expenditure on psychiatric hospitalizations, while the remaining 17% referred to psychiatric hospitalizations related to the use of other drugs. Between 2001 and 2009, there was a 40% reduction in psychiatric hospitalizations, while expenditure on out-of-hospital mental health services increased by 400%, providing evidence of significant investment in these activities.¹

The psychiatric care network consists of offering services structured at different levels of care, in the care of people with mental suffering, in a territorialized and articulated way.

Replacement of specialized hospital services by out-of-hospital care services is the result of implementation of regulatory acts that promote the expansion of the Psychosocial Care Network as well as increased resources for Psychosocial Care Centers, Primary Health Care Centers, the Family Health Strategy, Clubhouses and other community-based services.²⁻⁵ In this way, the health care network is designed to offer several types of services and to be structured on different care levels for people with mental suffering, in a territorialized and articulated manner.⁶

The scaling up of the coverage of these services has led to a reduction in psychiatric hospitalization rates. It can be deduced from this swing that people with mental suffering being linked to out-of-hospital services enables early detection of need for care and provision of mental health actions, thus reducing the possibilities of progressing to conditions that require psychiatric hospitalization.⁶ On the other hand, the reduction in the number of hospitalizations did not prevent them

for being responsible for one third of mental health expenditure up until 2008, thus demonstrating the high cost of this service.⁷

From then onwards, investment in psychiatric hospitalizations has reduced, while expenditure on out-of-hospital services has not increased in the same proportion,⁸ in the current scenario of health system underfunding and the imminent need to increase permanent sources of funding to sustain the Brazilian National Health Service (SUS).⁹

In view of the complexity and financial impact of hospitalizations on the SUS, analysis of the behavior of psychiatric hospitalizations and their cost enables the availability of resources for this level of care to be monitored and, therefore, the possibility of adopting measures to restructure services and reallocate resources intended for mental health. Ultimately, this analysis enables identification of how the resources invested strengthen health policies and the psychosocial care model.

It is appropriate to identify and understand the behavior of expenditure on psychiatric hospitalizations in hospital facilities, including retrospectively, since understanding past trends of expenditure on psychiatric hospitalizations provides relevant information for assessing subsequent probabilities, in view of the need for greater financial incentives in hospital and out-of-hospital care.¹

The objective of this study was to analyze expenditure on psychiatric hospitalizations in the State of São Paulo in 2014 and 2019.

Methods

This was a descriptive ecological study based on data on psychiatric hospitalizations that occurred in the State of São Paulo in 2014 and 2019.

In 2019 the State of São Paulo had 477 general hospitals and 92 specialized hospitals, and a total of 6,279 SUS hospital beds for psychiatric and mental health cases.¹⁰

Hospitalizations paid for by SUS are recorded on its Hospital Information System (SIH/SUS),⁸ which was the source of the data used in this study.

The study included all hospitalizations that occurred in São Paulo State in 2014 and 2019, in general and specialized hospital facilities available on the SUS. The main diagnoses of these cases, as informed on

the SUS Hospitalization Authorization form (AIH/SUS) and identified according to the codes used by the International Statistical Classification of Diseases and Related Health Conditions – 10 Revision (ICD-10), were comprised of mental and behavioral disorders due to psychoactive substance use (F10-F19), schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders (F20-F29), as well mood disorders (F30-39).

The following variables were analyzed.

- a) Sex (male; female);
- b) Age group (categorized in years, as recorded on AIH/SUS: under 1 year old; 1-4; 5-14; 15-49; over 50 years old);
- c) Nature of hospitalization (elective; urgent);
- d) Length of stay in a hospital facility (in number of inpatient days: periods that cannot be expressed as being less than 24 hours);
- e) Expenditure (total AIH/SUS amount) – data originating from abridged hospitalization microdata files, available for download on the SUS Information Technology Department (Datusus) website: <http://www2.datusus.gov.br/DATASUS/index.php?area=0901&item=1&acao=25>.

The data were retrieved during June 2020, using version 4.1.5 of the Data Tabulator for Windows (Tabwin), developed and made available by Datusus (Figure 1). The retrieved records were exported to Microsoft Excel, so as to comprise an electronic spreadsheet database.

Cost calculation is based on a macro-costing method, from the viewpoint of a public health service provision facility, in the short term. It should be emphasized that macro-costing refers to aggregated cost components, which offer an overall panorama, where the aggregate cost is divided by the number of patients cared for.¹¹

The cost measurements were expressed as units in Brazilian real (BRL), taking the total amount for AIH/SUS corresponding to the amount approved for hospitalizations in the period.

The cost of hospitalizations in 2014 was adjusted for inflation during the period (2014-2019), as per the National Consumer Price Index – Extended (IPCA); 2014 was taken as the reference year and adjusted by multiplying the reference value by the cumulative IPCA factor for the period.

The paired Wilcoxon test, with a 5% significance level, was used to compare the 2014 data with the 2019 data, using IBM SPSS Statistics, version 19.

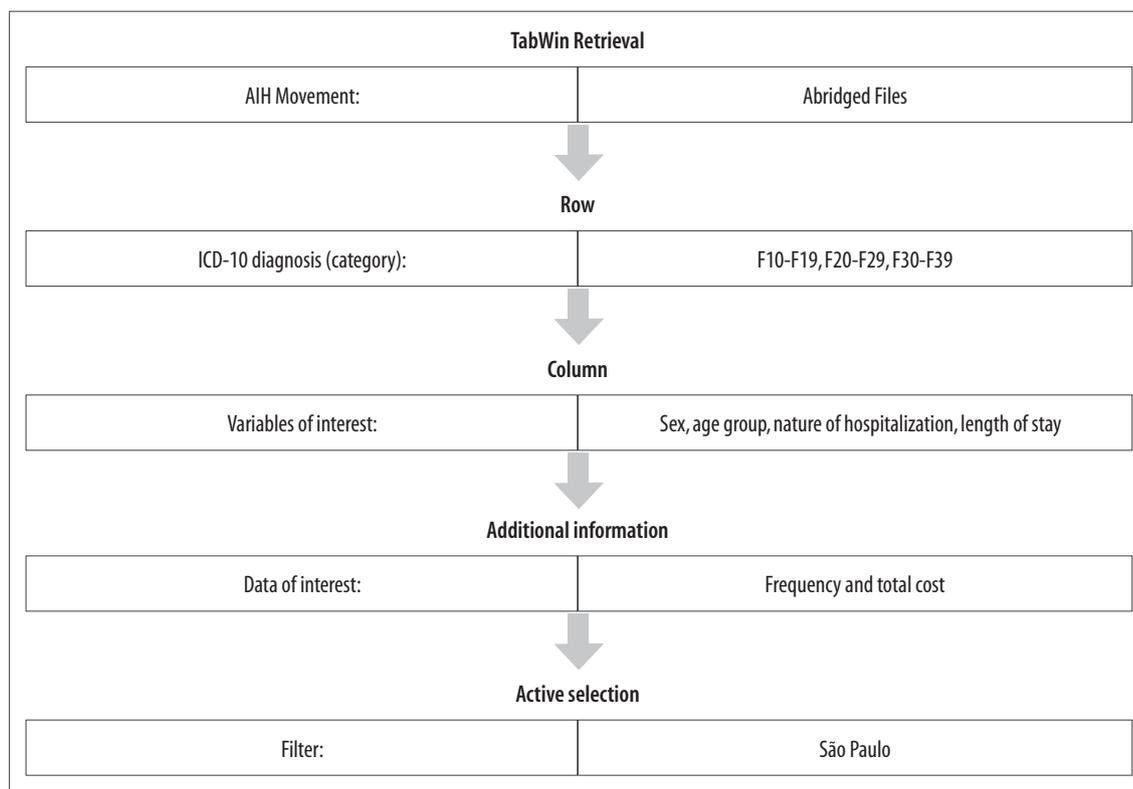
Results

Psychiatric hospitalizations accounted for 4.63% of the frequency and 3.04% of the expenditure on hospitalizations in 2014 (total of 2,496,141 hospitalizations; total cost BRL 4,282,978,913.12); and 3.02% of the frequency and 2.07% of expenditure in 2019 (total of 2,606,084 hospitalizations; total cost BRL 3,567,275,379.00). As shown in Table 1, in the study period there was a 31.38% reduction in hospitalizations and a 42.94% reduction in expenditure on them. The difference in expenditure was statistically significant ($p=0.014$).

Among the conditions analyzed, the most frequent psychiatric hospitalizations occurred due to schizophrenia (F20), mental and behavioral disorders due to use of alcohol (F10) and mental and behavioral disorders due to use of multiple drugs and other psychoactive substances (F19). Expenditure on these three conditions reduced over the period, by 59.20%, 32.10% and 9.39% respectively. Together, these three conditions accounted for 69.77% of the frequency and 74.19% of the amount spent on psychiatric hospitalizations in 2014; while in 2019 they accounted for 61.79% of the frequency and 69.60% of the amount spent. When comparing the data for the two years selected, there was a variation of -39.24% in frequency and -42.94% in the amount spent in the period.

With regard to the nature of the psychiatric hospitalizations (Table 2), elective hospitalizations showed a statistically significant reduction in frequency (-43.79%; $p=0.003$) and in the amount spent (-46.15%; $p=0.005$). Urgent psychiatric hospitalizations only showed statistically significant reduction in the amount spent (-40.21%; $p=0.028$), and their frequency also reduced (-22.90%) although not in a statistically significant manner. Urgent psychiatric hospitalizations predominated in 2014 and 2019, accounting for 59.40% and 66.74% of hospitalizations, respectively.

The average cost of psychiatric hospitalization went down from BRL 1,117.81 in 2014 to BRL 929.54 in 2019. During the same period, the reduction in the average cost of each hospitalization was greater for



AIH: Hospitalization Authorization form. ICD-10: International Statistical Classification of Diseases and Related Health Problems – 10th Revision.

Figure 1 – Procedure adopted for data identification and inclusion

Table 1 – Frequency and costs (in Brazilian real [BRL]) of psychiatric hospitalizations, state of São Paulo, 2014 and 2019

Diagnosis group	Hospitalizations in 2014	Hospitalizations in 2019	Percentage variation	p-value ^b	Cost (BRL) in 2014 ^a	Cost (BRL) in 2019 ^a	Percentage variation	p-value ^b
Mental and behavioral disorders due to psychoactive substance use (F10-F19)	39,595	29,994	-24.25		35,871,811.61	28,103,336.41	-21.66	
Schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders (F20- F29)	60,151	32,365	-46.19	0.109	78,294,767.79	33,305,672.55	-57.46	0.014
Mood disorders (F30-F39)	15,906	16,996	6.85		15,110,881.46	12,354,800.36	-18.24	
Total	115,652	79,355	-31.38		129,277,460.86	73,763,809.32	-42.94	

a) 2014 expenditure adjusted according to the National Consumer Price Index – Extended (IPCA); b) Paired Wilcoxon test.

Table 2 – Frequency and costs (in Brazilian real [BRL]) of psychiatric hospitalizations, according to selected variables, state of São Paulo, 2014 (n=115,652) and 2019 (n=79,355)

Variables	Hospitalizations in 2014	Hospitalizations in 2019	Percentage variation	p-value ^b	Cost (BRL) in 2014 ^a	Cost (BRL) in 2019	Percentage variation	p-value ^b
Sex								
Male	73,220	49,713	-32.10	0.221	81,432,256.64	48,148,283.49	-40.87	0.069
Female	42,432	29,642	-30.14	0.065	47,845,204.22	25,615,525.83	-46.46	0.002
Age range (years)								
<1	6	2	-66.67	0.157	1,974.71	321.90	-83.70	0.116
1-4	24	21	-12.50	0.776	7,104.63	4,672.99	-34.23	0.875
5-14	447	596	33.33	0.872	362,437.48	313,356.53	-13.54	0.378
15-49	73,318	54,373	-25.84	0.259	74,698,372.69	47,173,882.52	-36.85	0.030
>50	41,857	24,363	-41.79	0.064	54,207,571.35	26,271,575.38	-51.54	0.006
Nature of hospitalization								
Elective	46,954	26,391	-43.79	0.003	59,441,996.67	32,010,495.90	-46.15	0.005
Urgent	68,698	52,964	-22.90	0.554	69,835,464.19	41,753,313.42	-40.21	0.028

a) 2014 expenditure adjusted according to the National Consumer Price Index – Extended (IPCA); b) Paired Wilcoxon test.

urgent hospitalizations (from BRL 1,016.56 to BRL 788.33), when compared to the reduction in the average cost of elective hospitalizations (from BRL 1,265.96 to BRL 1,212.93).

Length of stay in hospital reduced 43.88% in terms of the absolute number of inpatient days, from a total of 2,316,145 days in 2014 to 1,299,912 days in 2019. This difference was statistically significant ($p=0.007$). Average length of stay in hospital in 2014 was 20.03 days, while in 2019 it was 16.38 days. Male hospitalizations were found to be predominant (63.31% of hospitalizations in 2014; 62.65% in 2019), as were hospitalizations in the 15-49 age group (63.40% in 2014; 68.52% in 2019).

There was a statistically significant difference in the amount spent on female hospitalizations (-46.46%; $p=0.002$), those in the 15-49 age group (-36.85%; $p=0.030$) and for those over 50 years old (-51.54%; $p=0.006$). The 5-14 age group was the only one in which frequency of hospitalization increased (33.33%), although average expenditure on hospitalizations in this age group reduced (-13.54%).

Discussion

The findings of this study about the State of São Paulo reveal an important reduction in the amount spent and

a fall in the frequency of elective and urgent psychiatric hospitalizations, in all ages and both sexes, and enable it to be inferred that such health problems are being resolved by out-of-hospital services.

We recognize that this study has limitations: use of SIH/SUS data derived from the coding and filling in of the AIH/SUS, which requires clinical knowledge and adequate processes, AIH/SUS form validity of up to 30 days, and categorization of age ranges as defined by the SIH/SUS system, when aggregating different stages of the life cycle, despite psychopathology and treatment possibilities. Notwithstanding these limitations related to the SIH/SUS system, data derived from government databases are widely used and enable reliable results capable of informing important local interventions.

The reduction in psychiatric hospitalizations is in keeping with the results of a study conducted between 2000 and 2004, in the State of Rio Grande do Sul, about the work of the Psychosocial Care Network, which highlighted the low frequency in all the Psychosocial Care Centers studied and enabled certain inferences, including the reduction in hospitalizations being associated with work done by community services.¹²

With regard to the expansion of community services in the State of São Paulo in the period analyzed, there was an 4.24% increase in Primary Care, Family Health Strategy and home care establishments linked to the

SUS, and a 32.11% increase in the availability of Psychosocial Care Centers: from 408 in 2014 to 539 in 2019. In parallel, there was a 43.66% reduction in SUS psychiatry and mental health hospital beds from 11,145 in 2014 to 6,279 in 2019.¹⁰

This profile corroborates data for the São Paulo and Rio de Janeiro metropolitan regions for the period 2008-2015, when association was found between expansion of Psychosocial Care Centers and primary care services, and reduction in psychiatric hospitalization rates, highlighting the importance of public policies aligned with psychiatry and health reform principles.⁶

In this context it is appropriate to point out that although there is unequal distribution of resources for community mental health services and different ways of organizing services and health team compositions in Brazil, the care provided results in reduction in the frequency and length of inpatient stay.¹²

Another important factor is the reduction in psychiatry beds in specialized hospitals. Hospitalizing people with mental disorders in general hospitals is an important initiative for psychosocial treatment continuity, according to the anti-mental hospital paradigm. In this way, increasing comprehensive access to health care reduces stigmatization of mental disorders, improves physical health care and makes integration and articulation possible between different services and specialties.¹³

The falling behavior of expenditure on psychiatric hospitalizations is similar to the experience of Medicare beneficiaries in the United States, where the implementation of a care model centered on community mental health care reduced expenditure, hospitalizations and emergency service use.¹⁴

It is imperative to propose reflections on hospital expenditure reduction and reallocation of resources to other structures and services associated with mental health, thus enabling increase in access, qualified service provision and comprehensive health care. This reduction in expenditure should be linked to maintaining and increasing investments in community care, such as Psychosocial Care Centers and Primary Care and Family Health Strategy service, responsible for health promotion and control actions, without doing away with adequate support from the Urgent Mobile Care Services (*Serviços de Atendimento Móvel de Urgência*) and emergency facilities in

situations of crisis and urgency.¹⁵ Notwithstanding, the phenomenon of underfunding is more than evident in the proportional reduction of budget resources intended for mental health.

Standing out in the diagnoses of psychiatric hospitalizations are cases related to schizophrenia (F20), due to its severe, chronic and debilitating nature,¹⁶ and its incidence and prevalence in the population;¹⁷ and mental disorders and behaviors due to use of alcohol (F10), as well as use of multiple drugs and other psychoactive substances (F19).

It is plausible to consider that part of people who have mental disorders do not receive treatment; i.e. there is a mental health treatment gap. Above all in relation to schizophrenia there is an estimated 32.20% average global gap in the treatment of this condition.¹⁸

The reduction in expenditure on hospitalizations related to problematic use of alcohol and other drugs may be related to the increase in 'therapeutic communities', as they are referred to by Resolution No. 1 of the National Council on Drug Policies, dated August 19th 2015. Therapeutic communities are non-governmental institutions organized in the form of collective homes with variable length of stay, and provide care mainly for people with problems related to drug use. Despite being a type of establishment that is on the increase, therapeutic communities have been criticized by mental health professionals because of the care models adopted and the structure possibly capable of fragmenting public health and social service networks.¹⁹ It is important to emphasize that greater investment in therapeutic communities and non-governmental organizations does not guarantee maintained quality of mental health care in accordance with psychiatric and health reform guidelines, given that their health logic is market-based.²⁰

Standing out in the analysis of the age groups is the increase in hospitalizations among 5 to 14 year-olds. The interpretation of the increase in hospitalizations in this age range is dichotomous, given the need to understand the context in which these hospitalizations occur. On the one hand, the positive value of early identification of symptoms characteristic of mental disorders has to be recognized. On the other hand there is the negative reality of fragile family ties, early use of psychoactive substances, social marginalization and violence, as well as shortage of specialized child and adolescent care services.²¹

Appearance of psychotic symptoms and behavior changes in schizophrenia and other mental disorders may occur at the beginning of adolescence, when early diagnosis can enable better prognosis, even if this means experiencing the trauma of psychiatric hospitalization.²² Compared to psychosis that starts in adulthood, psychosis that starts in childhood/adolescence is associated with more severe symptoms and poorer results and, if not treated early, may lead to worse outcomes in adulthood and premature death.²³

Moreover, court-ordered hospitalizations of these adolescents occur frequently. This fact raises questions about their social and family context, and the possibility of promoting the necessary changes, in articulation with the psychosocial care network, with the aim of preparing for their discharge.²⁴

A study conducted in São Paulo in 2013 listed the main reasons for adolescent hospitalizations as being self- and hetero-aggressiveness, psychotic symptoms and psychomotor agitation, with length of hospital stay ranging from 14 to 77 days.²⁴

Length of hospital stay varies according to the type of disorder and how long symptoms recur for, although it may be longer due to the nature of hospitalization, as is the case of court-ordered hospitalizations, which leads to these adolescents being stigmatized as “incapable of living in society”.²⁵

As such, we reiterate the need to reflect on the approach to child and adolescent mental health, whether the SUS has a sufficient number of services to care for and accompany them, in a manner coordinated with other social services, what investments need to be made and where they should be allocated.²¹

In the case of the elderly, the reduction in the number of hospitalizations may be related to use of therapeutic communities as an alternative for those for whom, in principle, psychiatric hospitalization would be indicated. In this setting, according to the Therapeutic Community National Inspection Report, published in 2018, therapeutic communities are being used as long-stay facilities for elderly people, or for interning people who have problems that are not associated with drug use, without the necessary conditions to care for them.²⁶

Another reason for the reduction in elderly psychiatric hospitalizations relates to care of clinical comorbidities. Health conditions in elderly people which require hospitalization in general hospitals

result in psychiatric diagnosis not being the main cause of hospitalization.²⁷

Based on the results presented and on our ponderings about reduced hospital expenditure and reallocation of resources to other structures and services associated with mental health in the State of São Paulo, it is important to emphasize the urgency of driving forward actions that can contribute to the continuity of services linked to the psychosocial care model, increased access and provision of qualified care by this Public Health sector.

This study addresses aspects of extreme relevance from the point of view of characterization and analysis of psychiatric hospitalization frequency and expenditure. It provides elements for evaluating the effectiveness of resources intended for hospitalizations in psychiatric beds and their relationship with Psychiatric Reform policies. Its conclusions reveal circumstances that compare these aspects with the current context of mental health care in the State of São Paulo, and point to a challenge raised by allocating resources to hospital and out-of-hospital components: implementation of mental health points-of-care, on the primary and secondary care levels, not only in São Paulo but rather more widely all over Brazil.

The need exists to provide assistance to SUS service users at all levels of care, to define effective and low-cost intervention, including formulation and implementation of mental health policies with specific budgets, in addition to improving programs already implemented, strengthening community-based services and, above all, deconstruction of the concept of hospitals being the only appropriate place for solving health problems.

Through the analysis of expenditure on psychiatric hospitalizations, it is possible to identify effective strategies, both in service restructuring and in allocation of resources for mental health. The results obtained by this study suggest the further studies need to be conducted, with the purpose of investigating the hypothesis of reducing psychiatric hospitalizations by allocating greater investments to community-based services.

Authors' contributions

Dias BM contributed to the concept and design of the study, analysis and interpretation of the results,

drafting and critically reviewing the contents of the manuscript. Badagnan HE, Marchetti SP and Zanetti ACB contributed to analysis and interpretation of the results, drafting and critically reviewing the manuscript.

All the authors have approved the final version of the manuscript and are responsible for all aspects thereof, including the guarantee of its accuracy and integrity.

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