Brazilian Journal of Psychiatry
bjp
Revista Brasileira de Psiquiatria
Brazilian Psychiatric Association
Fully open access
No APCs

BJP PRE-PROOF
(article published as accepted)

Brief Communication

The funding of hospital beds allocated to the care of psychiatric patients in a general hospital located in Palmas, Tocantins

Railson Alves de Freitas, Victor Nepomuceno, Antônio Geraldo da Silva, Leonardo Baldaçara

http://doi.org/10.47626/1516-4446-2026-4868

Submitted: 08-Feb-2026

Accepted: 16-Jun-2026

This is a preliminary, unedited version of a manuscript that has been accepted for publication in the Brazilian Journal of Psychiatry. As a service to our readers, we are providing this early version of the manuscript. The manuscript will still undergo copyediting, typesetting, and review of the resulting proof before it is published in final form. The final version may present slight differences in relation to the present version.

The funding of hospital beds allocated to the care of psychiatric patients in a general hospital located in Palmas, Tocantins

Railson Alves de Freitas[1,2,3], Victor Nepomuceno[1], Antônio Geraldo da Silva[3], Leonardo Baldaçara[1,3,4]

1 Universidade Federal do Tocantins, Palmas, TO, Brazil.
2 Afya, Medicina, Palmas, TO, Brazil.
3 Associação Brasileira de Psiquiatria, Rio de Janeiro, RJ, Brazil.
4 Hospital Geral de Palmas, Palmas, TO, Brazil.

Corresponding author:
Leonardo Baldaçara
ARSO 21, Alameda 9, Qi 10, 10
Palmas - TO, Brazil
Zip code 77015-222
e-mail: leonardobaldassara@gmail.com

BJP PRE-PROOF

Abstract

Background: Brazil's Unified Health System (SUS) mental inpatient care relies on government funding, especially in structurally unequal regions. Despite funding concerns, general hospitals manage serious mental disorders strategically.

Objective: Determine if federal transfers cover the true cost of psychiatric hospitalizations in a Northern Brazilian general hospital.

Methods: This cross-sectional cost analysis examined all 2023 psychiatric admissions in the Dr. Emílio Vasques Psychiatric Unit, General Hospital of Palmas, Tocantins. While the institution has 22 inpatient beds, only 11 are registered and eligible for federal funding by the Ministry of Health. Direct and indirect costs were evaluated using microcosting and absorption costing. Official national databases provided federal transfer statistics.

Results: 421 hospitalizations. Annual costs was BRL 13.984.390,24 (USD 3,107,642.28). Spending was 44.6% direct and 55.4% indirect. The average

hospitalization cost BRL 33.217,08 (USD 7,381.57). Federal transfers covered 12% of direct hospitalization expenditures, half the unit's operational capacity. Conclusion: Federal funding for mental inpatient care is insufficient, transferring the financial burden to state governments and compromising service viability.

Keywords: Cost analysis; Health management; Psychiatric inpatient care; Mental health policy.

Introduction

Brazilian health care is regionally disparate. Northerners received 35% of community mental health treatments in 2017, compared to 50% nationally.[1] From 2008 to 2017, psychiatric hospital beds in Brazil decreased from 51,413 to 34,249, with a significant decrease in the Northern region (620 to 378).[1] Brazil's Unified Health System (Sistema Único de Saúde – SUS) prioritizes deinstitutionalization and community-based care, but the pace and extent of these changes vary across regions, worsening mental health service gaps.

General hospital psychiatric units provide vital and complementary care for persons with major mental illnesses, especially during acute crises that require interdisciplinary, integrated medical care.[1, 2] In locations with inadequate community services, hospital-based mental health care is crucial. If hospitalization costs exceed public funds, general hospital psychiatric inpatient care may not be sustainable.[3] Federal financial transfers must be evaluated for evidence-based mental health policy.

This study investigates whether government financing for psychiatric hospital beds at Tocantins' General Hospital of Palmas covers actual hospitalization costs. First micro-costing study of Northern Brazil's psychiatric inpatient beds.

Methods

The Dr. Emílio Vasques Psychiatric Unit (UPEM) at the General Hospital of Palmas (HGP), the state capital of Tocantins, Brazil, undertook this descriptive, observational study. Residents receive inpatient psychiatric care at UPEM, which also refers challenged patients to other states and regions. This

BJP PRE-PROOF

unit has 22 inpatient beds (10 female, 12 male). We used the hospital's administrative-clinical management system (the software SOUL MV) in 2023.

The cost analysis approach included data collection, direct and indirect cost classification, absorption costing definition, and interpretation. Direct costs referred to resources directly consumed in patient care delivery, allowing objective attribution to the psychiatric unit's activities, whereas indirect costs represented overhead and shared institutional expenditures that supported service operation but were not directly traceable to specific patients or procedures.

Total admissions and departmental expense reports provided psychiatric hospitalization cost statistics. Data on federal funding for psychiatric inpatient care were obtained from public databases, including the National Registry of Health Establishments (Cadastro Nacional de Estabelecimentos de Saúde – CNES) and the Financial Limit Control System for Medium- and High-Complexity Care (Sistema de Controle do Limite Financeiro da Média e Alta Complexidade – SisMAC). We did a comparative analysis to determine if federal transfers covered psychiatric hospitalization maintenance costs.

Results

Data were present in Brazilian Real (BRL, R$) and United States Dollar (USD) in tables 1 and 2. The female psychiatric ward had 187 hospitalizations and the male ward 234 in 2023, totaling 421. The General Hospital of Palmas' Psychiatric Unit's 2023 psychiatric admissions cost 13.984.390,24 (USD 3,107,642.28; conversion rate: USD 1 = BRL 4.50).

Cost decomposition showed that direct costs (attributable to patient care and the provision of services within the psychiatric unit) were 44.6% of total expenditures, while indirect costs (institutional expenditures that supported service operation) were 55.4%. Indirect costs dominate mental inpatient care at this public general hospital, indicating that structural, administrative, and shared institutional costs are high. The mean cost per hospitalization (per patient) was BRL 33.217,08 (USD 7,381.57). The mean direct cost per hospitalization was BRL 14.826,94 (USD 3,292.88) per patient. The mean monthly running cost of the psychiatric facility was BRL 1.165.365,85 (USD 258,970.19) throughout time. See table 1 for details.

BJP PRE-PROOF

Table 1. Direct and indirect costs of the Psychiatry Unit of General Hospital of Tocantins in 2023.

Component	BRL† (R$)	USD‡ (1 USD=R$ 4.50)	Proportion
Direct costs	6.242.142,88	1,387,142.86	44.6%
Indirect costs	7.742.247,36	1,720,499.41	55.4%
Total costs	13.984.390,24	3,107,642.28	100.0%
Mean total costs per patient	33.217,08	7,381.57	-
Mean direct costs	14.826,94	3,292.88	
Mean total costs per month	1.165.365,85	258,970.19	-

† BRL: Brazilian Real.
‡ USD: United States Dollar

As the study was performed in a general hospital setting, indirect costs were not analyzed separately. The allocation of shared overhead expenses specifically attributable to the psychiatric service was methodologically challenging because infrastructure and support services were used jointly across different medical specialties. Such overhead costs included hospital administrative services, electricity for common areas, and maintenance of equipment serving the institution.

Personnel expenses accounted for 78.1% of total direct costs, amounting to BRL 4.874.711,28 (USD 1,083,269.22). Of this total, BRL 3.478.094,37 (USD 772,909.86; 55.7%) corresponded to statutory personnel, defined as permanent public employees hired under the legal civil service framework, whereas BRL 1.396.617,11 (USD 310,359.36; 22.4%) was attributable to temporary personnel, defined as workers hired under fixed-term or non-permanent contractual arrangements. This distribution underscores the labor-intensive nature of psychiatric inpatient care and its strong dependence on human resources. For more details, see table 2.

Table 2. Detailed direct costs of the Psychiatry Unit of General Hospital of Tocantins in 2023.

Component	BRL† (R$)	USD‡ (1 USD=R$ 4.50)	Proportion
Total costs	**6.242.142,88**	**1,387,142.86**	**100.0%**

BJP PRE-PROOF

Personnel	**4.87.711,28**	**1,083,269.22**	**78.1%**
Temporary employee	1.396.617,11	310,359.36	22.4%
Statutory employee	3.478.094,37	772,909.86	55.7%
Consumable materials	**320.880,58**	**71,306.80**	**5.1%**
Medical – Hospital supplies	17.351,68	3,855.93	0.3%
OPME (Orthoptics, prosthetics, and special materials)	913,27	202.95	0.01%
Medications	297.965,08	66,214.46	4.8%
Nutrition	4.650,55	1,033.46	0.1%
Third-party services	**672.722,06**	**149,493.79**	**10.7%**
Healthcare waste collection service	38.493,64	8,554.114	0.6%
Laundry	307.403,35	68,311.86	4.9%
Medical-hospital services	326.825,06	72.627.79	5.2%
General costs	**373.828,76**	**83,073.06**	**6.0%**
Water and sewage	26.936,70	5,985.93	0.4%
Electricity	346.892,09	77,087,13	5.6%
Mean costs per patient	14.826,94	3,294.88	-
Mean costs per month	520.178,57	115,595.24	-

† BRL: Brazilian Real.
‡ USD: United States Dollar

Materials and pharmaceuticals accounted for a smaller proportion of direct costs. Consumables—defined as routine non-durable items used in daily care and hospital operations—amounted to BRL 320.880,58 (USD 71,306.80; 5.1%), whereas medical-hospital supplies—defined as clinical materials specifically used in patient care, monitoring, and basic therapeutic procedures—totaled BRL 17.351,68 (USD 3,855.93; 0.3%). Expenditures on orthotics, prosthetics, and special materials were minimal, reaching BRL 913,27 (USD 202.95; 0.01%), a finding consistent with the clinical profile of psychiatric hospitalizations, which generally require fewer procedural or surgical materials. Medication costs totaled BRL 297.965,08 (USD 66,214.46; 4.8% of direct costs), indicating that although pharmacological treatment is essential, it represents a relatively small share of inpatient expenditures when compared with personnel-related costs. Nutrition costs totaled BRL 4.650,55 (USD 1,033.46; 0.1%). For more details, see table 2.

In addition, outsourced support services—including healthcare waste collection, laundry, and medical–hospital outsourced services—totaled BRL 672.722,06 (USD 149,493.79; 10.8%). Within this category, healthcare waste

BJP PRE-PROOF

collection accounted for BRL 38.493,64 (USD 8,554,14; 0.6%), laundry for BRL 307.403,35 (USD 68,311.85; 4.9%), and medical–hospital outsourced services—defined as contracted external services supporting clinical and hospital operations, such as specialized technical, diagnostic, or operational assistance—for BRL 326.825,06 (USD 72,627.79; 5.2%). For more details, see table 2.

Total operational costs reached BRL 373.828,76 (USD 83,073.06), representing 6.0% of direct costs, with electricity accounting for the largest share, BRL 346.892,09 (USD 77,087.13; 5.6%), followed by water and sewage expenses, BRL 26.936,70 (USD 5,985.93; 0.4%). The mean direct cost per patient was BRL 14.826,94 (USD 3,294.88), the total monthly direct cost was BRL 520.178,57 (USD 115,595.24). Additional information is provided in Table 2.

Discussion

According to data derived from Ministry of Health Ordinance No. 1,521/2013,[4] the annual federal transfer to the state of Tocantins corresponding to the authorized number of psychiatric beds was R$740,534.52 (USD 164,563.23, considering 1 USD=BRL 4,50). However, even when only direct hospitalization costs are considered, this amount was insufficient not only to sustain the psychiatric unit but also to fully finance the 11 beds formally authorized for federal reimbursement. Although federal funding was available for 11 of the unit's 22 operational beds, the amount transferred represented only 12% of the unit's total direct hospitalization costs. Even when considering the federal reimbursement allocated for the 11 beds, this amount would cover only 24% of direct costs, highlighting the insufficiency of federal funding to meet the actual costs of psychiatric inpatient care, leaving a substantial funding gap to be absorbed by the state of Tocantins.

Personnel costs dominate the cost structure, followed by outsourced services and general operational expenses. Pharmacological and material costs are quite minimal. In this analysis, the average total cost per psychiatric hospitalization was BRL 33.217,08 (USD 7,381.57) in 2023. The mean direct cost per hospitalization was BRL 14.826,94 (USD 3,292.88) per patient.

BJP PRE-PROOF

International evidence shows that psychiatric hospitalization costs vary widely due to health system organization, costing methods, duration of stay, and inpatient facility type. Differences in hospital costs across countries worldwide do not arise solely from greater or lesser efficiency but also from methodological heterogeneity, particularly regarding the inclusion or exclusion of direct, indirect, administrative, and capital costs. In addition, variations in wage structures, tax burdens, intensity of care, case complexity, technological incorporation, and the organizational model of health systems substantially influence the cost per hospitalization. Finally, exchange-rate fluctuations, inflation differentials, purchasing power parity, and varying levels of health system funding or underfunding may distort the nominal values reported, thereby limiting direct international comparability.

According to the Healthcare Cost and Utilization Project/Agency for Healthcare Research and Quality (HCUP/AHRQ) national database, representative per-admission estimates for direct psychiatric hospitalization costs range from USD 1,123 in Asia, based on a Taiwanese study, to USD 5,700 in the USA. [5, 6] A Spanish and German study found mean admission expenditures between USD 3,520.53 and USD 5,599.50; however, psychiatric hospitalizations may exceed this due to prolonged stays and multimodal care.[7, 8] In Oceania, public-sector micro-costing analysis and national data indicated mental disorder episode costs between USD 14,300 and USD 15,742 for staffing, infrastructure, and supplementary services.[9] Kenya projected direct hospital expenses at USD 1,848 per psychiatric admission.[10] Despite not being weighted continental averages, these estimates from national databases and individual studies show considerable diversity in psychiatric inpatient expenses worldwide. The cost per hospitalization at General Hospital of Palmas (HGP) was lower than in Australia, the USA, and Europe (high-income nations), but higher than in Asia and Africa. Despite tight health budgets, Latin American cost estimates are limited and methodologically variable, but they consistently show lower nominal costs than high-income countries. Mexico predicts USD 1,500 to USD 2,500, while Chile, Argentina, and Colombia estimate USD 1,000 to USD 3,500, depending on diagnosis, service complexity, and duration of stay.[11-14] All these values are lower than this study's values.

BJP PRE-PROOF

Since AIH/DATASUS records Brazilian Unified Health System reimbursement values rather than actual production costs, previously reported estimates of psychiatric hospitalization expenditure in Brazil are typically low, often below USD 860.00.[15] This pattern is supported by national Brazilian studies based on AIH data.[12-14] In São Paulo, mean hospitalization expenditures were estimated at USD 475.42 in 2014 and BRL 235.68 in 2019, values substantially lower than those observed in the present study.[2] Similarly, a statewide analysis of psychiatric hospitalizations between 2008 and 2019 estimated an average cost of USD 432.58 per admission (BRL 1,946.61), again reflecting reimbursement amounts rather than the real costs incurred in service delivery.[2] Therefore, the discrepancy between prior estimates and the present findings is likely explained, at least in part, by differences in costing methodology and data source. Moreover, psychiatric admissions in general hospitals may involve higher costs than those in psychiatric hospitals because of greater access to diagnostic services, specialist staff, emergency resources, and integrated medical support.[2]

Assessing the availability of mental health services requires a rigorous appraisal of network structural capacity and cost structures, with priority given to community-based models of care that can reduce hospitalizations through longitudinal follow-up, crisis prevention, and timely early intervention.[16] Although these services reduce the need for inpatient psychiatric care, many patients still need hospitalization for severe acute episodes, diagnostic clarification, intense monitoring, or protected management. Thus, the lack of psychiatric beds in normal hospitals hinders service continuity. According to World Health Organization (WHO) data, Brazil has 0.56 psychiatric beds in general hospitals per 100,000 people in 2019, far fewer than Portugal, Argentina, Uruguay, and Chile.[17] This study shows that even with community-based services, the demand for specialized inpatient care cannot be addressed, perpetuating a structurally deficient hospital network.

The study has limitations. First, research was conducted at a single Northern Brazilian tertiary public hospital, which may limit its application to other regions, hospitals, or treatment levels in the Brazilian Unified Health System. Cost distribution and expenditure profiles may depend on institutional structure, personnel composition, and regional financing. Second, absorption costing

BJP PRE-PROOF

includes indirect expenses; however, the research did not provide a breakdown of the overhead components. Institutional expenses may not have been completely gathered or assessed, affecting indirect cost allocation precision. Despite these limitations, the study provides a full microcosting assessment of inpatient psychiatric healthcare in an impoverished Brazilian region to feed health financing and policy discussions.

Our findings quantitatively demonstrate that current federal reimbursement mechanisms may be insufficient to sustain psychiatric inpatient services within general hospitals. Without revision of funding parameters aligned with real microcosting data, service continuity, regional equity, and expansion of psychiatric bed availability remain economically vulnerable, impacting the capacity to provide care for those who need it.

Author Contributions: CRediT TaxonomyRailson FreitasConceptualization-Equal, Data curation-Equal, Formal analysis-Equal, Investigation-Equal, Methodology-Equal, Project administration-Equal, Resources-Equal, Software-Equal, Validation-Equal, Visualization-Equal, Writing - original draft-Equal, Writing - review & editing-EqualVictor NepomucenoData curation-Equal, Formal analysis-Equal, Investigation-Equal, Methodology-Equal, Supervision-Equal, Validation-Equal, Visualization-Equal, Writing - original draft-Equal, Writing - review & editing-EqualLeonardo BaldaçaraConceptualization-Equal, Formal analysis-Equal, Supervision-Equal, Validation-Equal, Visualization-Equal, Writing - original draft-Equal, Writing - review & editing-Equal

Edited by: Rodolfo Damiano

References

1. Trapé TL, Campos RO. The mental health care model in Brazil: analyses of the funding, governance processes, and mechanisms of assessment. Revista de Saúde Pública. 2017;51(0). doi: 10.1590/s1518-8787.2017051006059.
2. Rocha HAd, Reis IA, Santos MAdC, Melo APS, Cherchiglia ML. Internações psiquiátricas pelo Sistema Único de Saúde no Brasil

BJP PRE-PROOF

ocorridas entre 2000 e 2014. Revista de Saúde Pública. 2021;55. doi: 10.11606/s1518-8787.2021055002155.

3. Brasil. Ministério da Saúde P. Portaria GM/MS nº 6, de 3 de outubro de 2017. Regulamenta o processo de contratualização de metas físicas e financeiras com os serviços hospitalares de referência: Diário Oficial da União.; 2017. Available from: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prc0006_03_10_2017.html#TITULOVIIICAPIIISECVII.
4. Brasil. PORTARIA Nº 1.521, DE 24 DE JULHO DE 2013. In: Saúde Md, editor. Brasília2013.
5. Stranges E, Levit K, Stocks C, Santora P. Statistical Brief #117State Variation in Inpatient Hospitalizations for Mental Health and Substance Abuse Conditions, 2002–2008. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs. Rockville (MD): Agency for Healthcare Research and Quality (US); 2011.
6. Lang H-C, Su T-P. The Cost of Schizophrenia Treatment in Taiwan. Psychiatric Services. 2004;55(8):928–30. doi: 10.1176/appi.ps.55.8.928.
7. Statistisches Bundesamt (Destatis). Cost of hospital treatment in Germany, 2019 Wiesbaden: Federal Statistical Office of Germany; 2021. Available from: https://www.destatis.de/EN/Home/_node.html.
8. Peiro S, Gomez G, Navarro M, Guadarrama I, Rejas J. Length of stay and antipsychotic treatment costs of patients with acute psychosis admitted to hospital in Spain. Social Psychiatry and Psychiatric Epidemiology. 2004;39(7). doi: 10.1007/s00127-004-0776-y.
9. Independent Health and Aged Care Pricing Authority. National Hospital Cost Data Collection. In: IHACPA, editor. Sydney: IHACPA; 2025. p. 1–46.
10. Kirigia JM, Sambo LG. Cost of mental and behavioural disorders in Kenya. Annals of General Hospital Psychiatry. 2003;2(1). doi: 10.1186/1475-2832-2-7.
11. Arredondo A, Díaz-Castro L, Cabello-Rangel H, Arredondo P, Recaman AL. Análisis de costos de atención médica para esquizofrenia y depresión en México para el periodo 2005-2013. Cadernos de Saúde Pública. 2018;34(1). doi: 10.1590/0102-311x00165816.

BJP PRE-PROOF

12. Ministerio de Salud de Chile. Estudios de costos hospitalarios en salud mental Santiago: MINSAL; 2019. Available from: https://www.minsal.cl/eje-salud-mental/.
13. Ministerio de Salud de la Nación (Argentina). Evaluaciones económicas de servicios de salud mental hospitalarios MSAL: Buenos Aires; 2018. Available from: https://www.argentina.gob.ar/salud.
14. Zamora-Rondón DC, Suarez-Acevedo DE, Bernal-Acevedo OA. Análisis de las necesidades y uso de servicios de atención en salud mental en Colombia. Revista de Salud Pública. 2019;21(2):175–80. doi: 10.15446/rsap.v21n2.71638.
15. Dias BM, Badagnan HF, Marchetti SP, Zanetti ACB. Gastos com internações psiquiátricas no estado de São Paulo: estudo ecológico descritivo, 2014 e 2019. Epidemiologia e Serviços de Saúde. 2021;30(2). doi: 10.1590/s1679-49742021000200024.
16. Yano KM, Prado SI, Novais MAPd. Caracterização de internações psiquiátricas: uma revisão integrativa. Revista Recien - Revista Científica de Enfermagem. 2022;12(38):68–79. doi: 10.24276/rrecien2022.12.38.68-79.
17. World Health Organization. Beds for mental health in general hospitals (per 100,000 population) Geneva: WHO; 2019. Available from: https://www.who.int/data/gho/data/indicators/indicator-details/GHO/beds-for-mental-health-in-general-hospitals-(per-100-000).

BJP PRE-PROOF