Psychosocial Healthcare Centres (CAPS) in Brazilian Mental Health Policy, 2008-2017

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Abstract

Psychosocial Healthcare Centres have been promoted by Brazilian mental health policy along with a guaranteed financing from the Ministry of Health. This paper used Strata 2014 data to analyse the extent of Psychosocial Healthcare Centres care capacity available for user as the central driver of mental health care in Brazil. Retrospective, descriptive study with secondary data analysis of services was undertaken using data from Brazilian federal government databases. Brazil does not have 100% mental health care coverage and our analysis, using the Brazilian Health Ministry criteria, identified only 36% (842) municipalities have been adequately resourced. Our analysis identified that while the number of CAPS units increased around 100%, due to increased extra-hospital and community services in the period, effective cover reduced due to budget cuts and increases as a result of rights to access. The Ministry of Health identified coverage in the ratio of 1 CAPS / 100 thousand inhabitants, although CAPS availability is not the only parameter for assessing mental health coverage. Within municipalities, the mental health network is not synonymous with CAPS nor its quality. We believe that the priority given to investing in CAPS, without guaranteeing resources for other mental health intervention, may negate the efforts of building of a network of new de-institutionalising services which replaced traditional models.

Introduction

The development of community-based alternatives to hospital care has been a longstanding global policy objective[15], including in Brazil. This was the result of a long struggle involving mental health movements[18], who represented a range of ideological viewpoints[31]. These movements had been involved in combating discrimination and inequality experienced by those with mental health problems, including resisting the medicalisation of distress[9], increased oppression[12] and demanding wider community services[29].

The Brazilian Ministry of Health has identified that around 3% of the population suffer from severe or persistent mental disorder, and a further 12% of the population requiring some mental health care, whether continuous or acute[24]. Furthermore, amongst alcohol and psychoactive substance misusers, more than 6% of the population have serious psychiatric disorders[24 14]. Brazil's Mental Health legislation[1] (Law 10.216)[2][8], facilitated the development of a psychosocial care network (RAPS) composed of various mental health services, including Psychosocial Care Centres (CAPS); Therapeutic Residential Services (SRT); Centres of Coexistence and Culture, along with Reception Units (UAS); and beds (in General Hospitals, CAPS III)[4]. Consequently, many argue that Brazil's mental health system was heavily influenced by citizens:

We have a national law, won by social Movements, which has been incorporated by society, judiciary branch, public managers. We have put in place a network that, although it still has gaps, extended the rights of users and their families and access to treatment under SUS[3][11].

Indeed, following the implementation of the Psychiatric Reform Law, psychosocial care encapsulated the primary provisions related to mental illness, alcohol and other drugs user care (AOD)[3]. Key elements of this mental health policy involved: a) reducing poor quality and expensive health care at both financial and social levels; b) rejecting the previous service delivery model by diversifying therapeutic resources and promoting the decentralisation of care[14] which was believed to be the result "…of new political and cultural relations"[2]. The authors believe that the "mental health" issue should be considered locally, at municipal level, but required financing from the three levels, namely: federal, state and municipal (historically a problem that was not solved at the time)[14].

Ministerial Ordinance 3088[6] was instituted as a proposal for the organisational structure of mental health services, which created and regulated the Psychosocial Care Network (RAPS), established guidelines, objectives and components for the network focused on mental health care[30]. The Mental Health network comprised various care agencies which supported the psychosocial care of services for those with mental disorders based on the population criteria and the demands of the municipalities (Table1).

To understand the complexity of CAPS in Brazil, it is necessary to contextualise the population service requirement. In total there are 5,570 municipalities (including Fernando de Noronha and the Federal District), however the majority of these, around 90% of the municipalities, are small (0 to 50,000 inhabitants) (See Table 2). Municipalities eligible for CAPS are those with a population over 15,000 inhabitants (TCU estimate, 2013), i.e. approximately 2,310 (42%) of Brazilian municipalities. In the CAPS classification for cities eligible for this type of service, small and medium-sized cities are more common, with about 23% and 57% of the population, respectively (See Table 3).

The function of the Centres of Psychosocial Care (CAPS), is to facilitate access to care for the population of a specific geographical area, with services of differentiated sizes and complexity adapted according to their enrolled population[11]. CAPS linked to the municipal health network are designed to deliver mental health assistance for users with mental disorders, support social and family integration, encourage autonomy and provide medical and psychological care[25]. Mental health care coverage is defined by the Ministry of Health as the existence of one Psychosocial Care Center per 100,000 inhabitants. The CAPS are of six types (CAPS I, CAPS II, CAPS III, CAPS AD, CAPS AD III, CAPSi) community Psychosocial Care Network (RAPS), with multidisciplinary teams and an interdisciplinary approach providing care only to those suffering from mental ill-health, including those requiring help with alcohol and other drugs, in their geographical area[21]. The implementation of these services comprise the core of the mental health reform[25]. As a result of the 2017[20] mental health reforms, nationally Brazil had 2,341 Caps services, comprising:

- 1,131 Caps I services
- 493 Caps II services
- 94 Caps IIIservices
- 316 Caps AD services
- 90 Caps AD III 24-hour services

- 219 Capsi services

The CAPS[20] provide community mental health services which have the following characteristics:

Caps I. Provide services to all age groups who are experiencing intense psychological distress due to severe and persistent mental disorder, including those related to using psychoactive substances, as well as other clinical conditions that make it impossible to maintain social ties or carry out daily living. Minimum staff levels for this service are: one doctor with training in mental health; one nurse; three university-level professionals (psychologist, social worker, occupational therapist, physical educator or other professional that is working therapeutically), four mid-level technical and / or nursing assistant staff members.

Capes II: This service primarily serves people in intense psychological distress as a result of severe and persistent mental disorders, including those related to the use of psychoactive substances, and other clinical situations that which have resulted in relapse. The minimum staffing levels are: one psychiatrist; one nurse with training in mental health; four higher level professionals (psychologist, social worker, occupational therapist, physical educator or other professional needed for the therapeutic project), six mid-level professionals for instance nursing technicians or assistants, administrative technician, educational technician and artisan).

The key difference between CAPs I and II services are the number and type of professionals (as described above) and number of citizens in a city.

Caps III - Primarily serves people in intense psychological distress resulting from severe and persistent mental disorders, including those related to the use of psychoactive substances, and other clinical situations that make it impossible to establish social ties and carry out life projects. This service provides 24-hour year round continuous care services, provide clinical back-up, as well as night time support to other mental health services, including to CAPS AD The minimum staffing levels comprise: two psychiatrists; one nurse with mental health training, five university level professionals for instance psychologist, social worker, occupational therapist, pedagogue, physical educator or other professionals as needed.

CAPS AD assists people of all age groups who present intense psychological distress due to the use of crack, alcohol and other drugs, or who are unable to establish social ties and carry out life ambitions. These services are provided in municipalities or health regions with population over 70,000 inhabitants. Their minimum staffing requirements are: one psychiatrist; one nurse with training in mental health; one clinical physician, responsible for the screening, evaluation and follow-up of clinical complications; four university level professionals (psychologist, social worker, occupational therapist, pedagogue, physical educator or other professional needed for the therapeutic project), six middle level professionals for instance nursing technician and/ or assistant, administrative technician, educational technician and artisan.

CAPS AD III services assist adults, children and adolescents, and in accordance with the Child and Adolescent Statute regulations with service users who are under intense psychological distress and require continuous clinical care. The service has 24-hour observation and monitoring throughout the year with up to 12 beds. Minimum staffing includes 60 hours per week for each medical professional, either psychiatrist and clinicians with training and / or experience in mental health; one nurse with experience and / or training in mental health; five university level professionals (psychologist, social worker, occupational therapist, pedagogue, physical educator or other professional needed for the therapeutic project), four nursing technicians; four mid-level professionals and one mid-level professional to perform administrative activities.

CAPSi services urgent children and adolescents who present with intense psychological distress resulting from severe and persistent mental disorders, including those related to the use of psychoactive substances, along with other clinical situations that make it impossible to maintain social bonds and carry out life tasks. The minimum staff complement comprises: one psychiatrist or neurologist or paediatrician with training in mental health; one nurse, four higher level professionals (psychologist, social worker, occupational therapist, pedagogue, physical educator or other professional required for the therapeutic project), five mid-level professionals (nursing technician and / or assistant, administrative technician, educational technician and Craftsman).

A recurring theme across all service levels, was the prioritization of access, along with the quality improvement of mental health services within the SUS[19]. In 2014 the Ministry of Health[23] identified that the 86% coverage rate had resulted in extra-hospital, territorial and community-based services. In 2016, 103% healthcare coverage was achieved on the basis of the number of CAPS services, although no single institution provided sole care coverage. However, the distribution of the CAPS institutions nationally is not homogeneous and consequently there are gaps in care services. As a result, questions are raised regarding the parameters of coverage and the claims that are made about these.

The National Mental Health Management Plan (2016 to 2019)[5] expanded the Psychosocial Care Network (RAPS) and resulted in the total CAPS in Brazil increasing from 1,701 to 2,209, an increase of 29.86%. CAPS AD and CAPS AD 24h, which provide monitoring and treatment of users of alcohol and other drugs, increased 40.5%, from 269 to 378[5]. Furthermore, objective 2 of the plan, aimed to improve and implement Health Care Networks in health regions, with emphasis on Urgency and Emergency Network, Cegonha Network, Psychosocial Care Network, Disabled Persons Care Network, and the Health Care Network of People with Chronic Diseases.

The Psychosocial Care Network has sought to “ensure health care and the free circulation of people with mental disorders”[4], with a key aim being to drastically reduce hospitalisations in psychiatric hospitals through expanded service access i.e. increased coverage of CAPSs, care facilities, residential therapeutic services, mental health beds in general hospitals and solidarity/co-operative enterprises using technical and financial subsidies. In addition, priority was given to expanding the care capacity for alcohol and drug users, with school-based drug prevention interventions being implemented for 6-14-year-olds and family-oriented drug prevention[5].

The development and execution of the national mental health plan has been undertaken in a politicalically unstable environment, marked by the impeachment of the Brazilian President Dilma, the new Temer government and latterly the Bolsonaro government (accused as being authoritarian and far right). 2016-2019

has resulted in increased psychiatric hospital beds, reductions in resources for CAPS, an increase in religious led therapeutic communities within the Psychosocial Care Network as well as disputes over public funding[14]. All of which raised the spectre of the return of asylums. Both the Temer and Bolsonaro government administrations have undertaken a dismantling of the psychiatric reform gains, while promoting a return to the policy of asylums of the past[1]. Consequently, the Temer and Bolsonaro Governments have resulted in Brazil transitioning away from progressive mental health policies such as the Psychosocial Care Centers.

Footnote:

[1] For World Health Organization (2015) Mental health legislation is a further key component of good governance and concerns the specific legal provisions that are primarily related to mental health. Although, alone 99 countries report having a stand-alone law for mental health, which represents 51% of WHO Member States[32].

[2] Act that provides for the protection and rights of persons with mental disorders and redirects the mental healthcare model[8].

[3] Electronic message no. 13/2011. On January 24, 2011.[28]

Method

Retrospective, descriptive study with secondary data analysis of services was undertaken using data from Brazilian federal government databases. Using the Ministry of Health[7] decree, the basic inputs of the Psychosocial Care Centers were identified, with 17 of these variables listed for an evaluation of the capacity of mental health services for instance, the numbers of services and professionals provided (See Table 4).

Multivariate Analysis was used to evaluate the regional context of mental health services across Brazil. The approach allowed for “an ever-expanding set of techniques for data analysis that encompasses a wide range of possible research situations”[16]. Factor and Principal Component Analysis, Ward Cluster Analysis and K-means Clustering techniques were the also applied, to review variables to enable structuring of the clusters.

Data analysis

Schematically, the factor and principal component analysis aimed to “…to find a way of condensing the information the contained in a number of original variables into a smaller set of variates (factors) with a minimal loss of information”[16]. Yhe original main variables facilitated the building of clusters. Using Ward Cluster Analysis, a hierarchical statistical technique, enabled the number of clusters to be established. K-means Clustering was used for the definitive structuring of these clusters.

Table 5 identifies the variables used in the factor analysis, these expressed the service demand (population, mental problem and suicide) in the context of supply factors such as installed public health capacity at the municipal level.

Table 6, factor 1 identifies 87% of the total variability while factor 2 explains 6% within the results, highlighting the importance (weight) of the first factor in the data variance compared to the second factor.

Consequently, Table 7 identifies the main factors related to the selection of original variables. The selection procedure made use of the interpretation of the Measure of Sampling Adequacy (MSA), where: 0.80 or above is worthy, 0.70 or above is meddlesome, 0.60 or above is unexceptional, 0.50 or above is low, below 0.50 is undesirable[16].

As a result, of the 13 variables listed for clustering, there were 11 variables most relevant for cluster formation.

Table 7 identifies that two variables are not relevant, namely Mental Health Expenditure (SUS) and Nursing Assistant, as they recorded lower factor loadings of 0.80.

TStandardised values (Z) of the analysed original variables were used to construct the following dendrogram. The dendrogram (Fig.2.) identified 5 clusters, and these are detailed according to K-means clustering.

Results

The study identified growing numbers of municipalities with expenditure on CAPS. This growth resulted from (See Table 8):

- the expansion of coverage due to higher federal transfers to municipalities with budget actions defined for CAPS funding[4];
- the Complementary Law No. 141, of January 13, 2012, which placed conditions the federal transfer linked to the completion of information within the Public Health Budgets Information System (SIOPS).

Municipalal information[5], along with the impact of the Complementary Law No 141 (table 8), demonstrated a growth of expenditure of 26% in the period 2012 to 2013 (except for the Midwest region). The municipalities in the North had the highest percentage increases over the 10 years, although in absolute terms, the Northeast and Southeast regions grew more (See Table 8). This resulted in a strong expansion in cities with a population of less than 20 thousand

inhabitants which grew by 500% across Brazil. In absolute terms, the largest expansion was in the small-medium stratum of municipalities with the addition of 268 CAPS services (See Table 9).

In analysing CAPS coverage, a further dimension should be considered, namely expenditure was a key measure to be considered. Over the ten years between 2008 and 2017, total real spending grew[6] in "municipalities" by 255% (See Graph 1). This figure identifies municipal health funding nationally by year, while federal government decreased expenditure[10 14]. Furthermore,[26] between 2000 and 2015, states and municipalities gradually increased their percentage share of total health spending. Consequently, the share of health expenditure reached 26.28% and municipalities 33.78% in 2015. The Federal Government, meanwhile, decreased its participation in health expenditure from 58.5% in 2000 to 39.94% in 2015[5]. The reduced participation of the Federal Government in total health spending does not imply the presence of a system of universal access and comprehensive care but rather the need for greater federal participation in health spending.

The South, Southeast and North regions expanded their total spending by 435%, 430% and 396%, respectively. However in 2015, the South and Northeast regions had municipalities eligible for CAPS at a higher level than the national percentage, particularly the states of Piaui, Rio de Janeiro, Rio Grande do Norte and Rio Grande do Sul.[23] (See Table 10).

In our analysis, medium-large sized cities (200,000 <pop. ≤1 million inhabitants) are largely responsible for the Mental health (SUS) expenditure variations. In the period under review, total real spending more than doubled with an overall 276% increase in funding. Similarly, small and small-medium cities grew by 207% and 276%, respectively. The group corresponding to one million population and above suggest that the effect of the Complementary Law No. 141 had greater influence rather than the expansion of spending, as there was almost no increase in the number of municipalities over 1 million (See Table 11).

As a result, all regions of the country increased the number of CAPS units. The North and Middle-West regions expanded the number of establishments with 176% and 116% variation (See Table 12). Those responsible for this expansion were the Small and Small-medium cities.

Despite the strong growth of coverage in the period analysed, the availability of staff to achieve the full capacity in mental health services in each municipality remains a key challenge. In the cluster analysis, of the 2,310 CAPS eligible municipalities, about 36% (842) met all variables indicating they had sufficient resource capacity.

We estimate that the clusters of the Psychosocial Healthcare Centers in Brazilian Mental Health Policy demonstrate alignment with the current aspiration of health in Brazil (Vianna, 2017), but even with the recent development having been undertaken, there is still a high degree of concentration and imbalance in available health care capacity resources in the different health regions.

K-means analysis identified 5 group clusters. Cluster categorisation followed certain economic i.e. city GDP, administrative and demographic characteristics (see table 13), such as the Central Cluster, Capital Cluster and Medium Cities Cluster. Rio de Janeiro and Sao Paulo, being the main cities in the country are classified as Central Cluster (see graphic 2) and form an exclusive group. In the Capital Cluster, although not all state capitals are present, this group has a considerable number of capital cities. In the Medium Cities Cluster there is a considerable prevalence of medium-sized cities.

That said, the concentration seen in the Central Cluster remains in the Capital Cluster, formed by the main state capitals of the country, and followed by the Medium Cities Cluster (See Graphic 2).

The average number of CAPs per municipality identified through K-means is approximately 2 per municipality. The average number of services for Central Cluster (RJ and SP) is 51, compared to 13 CAPs in the Capital Cluster, partly due to the demand in those cities. Consequently, the concentration of the two largest and most important cities in Brazil is more than twice the average of the other 8 cities of the Capital Cluster. The other clusters have lower levels, but with a higher degree of dispersal. Medium Cities had on average 5.2 CAPs and Intermediate Cities 2.6, while Small contributes 1.3.

CAPs I show a strong presence in all groups, the capitals have on average twice more than the average cities. As the size of the city increases, CAPs III and AD III increase their presence, but in smaller numbers than other modalities. On average, CAPs II are more present in the Central Cluster with 18 units per municipality. Rio de Janeiro and São Paulo are states that historically have municipalities with 70 thousand or more population (21.8% of Brazilian's live in São Paulo state and 3.2, fin Rio de Janeiro, for example)[13].

The policy of expanding CAPS with the aim of expanding RAPS, faces a challenge in the implementation of more comprehensive and complex CAPS services for instance CAPS ad, CAPS II and III, CAPSi and, in this sense, the larger municipalities are the ones that meet the requirements[5].

In Figure 5 it is possible to view the spatial distribution of the installed health capacity in service and mental health actions. It is possible to verify that the extreme south of the country and the area surrounding the federal capital, Brasília, are practically covered, with the northern extreme having low installed capacity.

Footnote:

[4] From 2010, with the implementation of the Crack Programme, it became possible to win and with the process of implementation of the Psychosocial Care Network (RAPS), the Ministry of Health defines 5 budgetary actions to ensure transfer of resources for implementation of RAPS (Budget Plan 20B0, 6233, 8585, 20AI and 20AD). Among these, action 20B0 is defined for the implementation of new points of care, with priority for CAPS implementation. These actions are identified in the Public Budget Information System (SIOP).

[5] Each municipality declares its data on the SIOPS database.

[6]The expression “municipalities” represents municipal expenditure made from all available sources of health resources - federal, state and own resources transfers – managed by the city.

Conclusion

The analysis of 10 years data identified that the increased development and availability of mental health services have been considerable. The evidence demonstrates that a substantial number of municipalities have increased spending on CAPS and that this these increases were significant in all regions and population clusters, with the medium-large cities having increased spending most. Small-medium municipalities are primarily responsible for the absolute increase in new CAPS units across the country.

Despite the significant progress, the demand for mental health services comes from about 44 million Brazilians, in 2019 (according to the population projection of the Health Ministry data)[24], which is a challenge in the management of the Mental Health System. The existence of the various staffing gaps (for example, number of doctors, nurses, social workers, etc) in resource capacity requires an ongoing policy commitment along with more investment. These gaps in care do not enable the guaranteed right of access to open and community services, for all regions of Brazil, but especially in the north of the country. In this sense, the sole paragraph of Article 2 of the Mental Health Law (10.216) established the right to “access to the best treatment of the health system, according to your needs”[8] is still not being met. Consequently, of the 2,310 municipalities eligible for CAPS, only around 36% met all variables of installed capacity in mental health services and actions.

Study Limitations

The main limitation of the adopted model is that it excludes some municipalities that have one or more resources in mental health. Consequently, while 36% of the municipalities have all sufficient resources through our analysis analysed does indicate that their mental health care is adequate. Rather it highlights that when assessing national mental health coverage, it is important to consider a full range of factors including the resource availability of municipalities, along with historical regional differences (economic, political and administrative) which influence health delivery.

The next step will be to develop a refinement on the existing care institutes in the various territories to ensure the delivery of care in mental health.

Declarations

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Ethics Statement

Not applicable

Disclosure statement

No potential conflict of interest was reported by the authors.

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Tables

Table 1
Profile of Mental Health Services by Municipal Profile

Municipality Profile	Mental Health Services recommended by the Ministry of Health
Up to 15 Thousand inhabitants	Basic Care Network with Mental Health services
Between 20 and 70 thousand inhabitants	Caps I Basic Care Network with Mental Health services
Between 70 and 200 thousand habitants	Caps II, Caps AD and Basic Care Network with Mental Health services
More than 200 thousand inhabitants	Caps III, Caps II, Caps AD, Capsi and Basic Care Network with Mental Health services, empowering SAMU
Source and Production: Health Ministry in Brazil[7].	

Table 2
Municipality Clusters by Population

Classification	Strata	n
Very small	Pop. ≤20,000	3,801
Small	20,000 < pop. ≤50,000	1,102
Small-medium	50,000 < pop. ≤100,000	355
Medium	100,000 < pop. ≤500,000	268
Medium-large	500,000 < pop. ≤1 million	25
Large	Pop. >1 million	19
Total		5,570
Production: by the authors, 2019.		

Table 3
Municipality for CAPS classification

Classification	Strata	n
Very small	Pop. ≤15,000	3,261
Small	15,000 < pop. ≤20,000	541
Small-medium	20,000 < pop. ≤70,000	1,307
Medium	70,000 < pop. ≤200,000	312
Medium-large	200,000 < pop. ≤1 million	132
Large	Pop. >1 million	17
Total		5,570
Production: by the authors, 2019.		

Table 4. Services available and unavailable (by municipality) – 2017

n	Variable	Unavailable	Available	Source
1	Population	-	5,570	IBGE
2	Mental problem	3,628	1,942	SIH
3	Suicide	2,470	3,100	SIM
4	Mental Health Expenditure (SUS)	4,787	783	SIOPS
5	Centres for Psychosocial Care I	4,295	1,275	CNES
6	Centres for Psychosocial Care II	5,173	398	CNES
7	Centres for Psychosocial Care III	5,512	58	CNES
8	Centres for Alcohol and Drugs Psychosocial Care	5,300	270	CNES
9	Centres for Alcohol and Drugs Psychosocial Care III	5,502	68	CNES
10	General Practitioner (physician)	513	5,057	CBO
11	Paediatrician (physician)	2,289	3,281	CBO
12	Psychiatrist (physician)	2,934	2,636	CBO
13	Psychologist	631	4,939	CBO
14	Social Worker	1,530	4,040	CBO
15	Nurse	4	5,566	CBO
16	Nursing Assistant	2,286	3,284	CBO
17	Nursing Technician	201	5,369	CBO
Population Census 2010 and 2017 of the Brazilian Institute of Geography and Statistics (Censo Demográfico 2010 e 2015 do Instituto Brasileiro de Geografia e Estatística-IBGE);Hospital Information System (Sistema de Informação Hospitalar – SIH) Mortality Information System (Sistema de Informação sobre Mortalidade-SIM); Information System on Public Health Budgets - ISPHB (Sistema de Informação sobre Orçamentos Públicos em Saúde-SIOPS);Ministry of Health (MH), National Registry of Health Establishments (Cadastro Nacional dos Estabelecimentos de Saúde do Brasil-CNES); National Occupation Classification (Classificação Nacional de Ocupação-CBO). Elaboration: by authors, 2019.				

Table 5
Variables to Cluster Analysis

1	**Population**
2	Mental problem
3	Suicide
4	Mental Health Expenditure (SUS)
5	Centres for Psychosocial Care (6 + 7 + 8 + 9)
6	General Practitioner (physician)
7	Paediatrician (physician)
8	Psychiatrist (physician)
9	Psychologist
10	Social Worker
11	Nurse
12	Nursing Assistant
13	Nursing Technician
Production: by the authors, 2019.	

Table 6
Factor Analysis

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	955.735	889.141	0.8694	0.8694
Factor2	0.66594	0.18230	0.0606	0.9300
Factor3	0.48364	0.23269	0.0440	0.9740
Factor4	0.25095	0.10730	0.0228	0.9968
Factor5	0.14365	0.04501	0.0131	10.099
Factor6	0.09864	0.07759	0.0090	10.189
Factor7	0.02105	0.02823	0.0019	10.208
Factor8	-0.00718	0.00633	-0.0007	10.201
Factor9	-0.01351	0.01704	-0.0012	10.189
Factor10	-0.03056	0.00481	-0.0028	10.161
Factor11	-0.03537	0.02329	-0.0032	10.129
Factor12	-0.05866	0.02473	-0.0053	10.076
Factor13	-0.08339	.	-0.0076	10.000
Production: by the authors, 2019.				

Table 7
Factor Analysis

n	Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Uniqueness
1	Population	**0.9199**	-0.1798	0.2802	-0.0182	-0.0679	0.0354	0.0767	0.0308
2	Mental problem	**0.8058**	-0.0239	-0.3562	0.1551	0.1483	0.0439	0.0536	0.1723
3	Suicide	**0.9084**	-0.0663	0.1029	-0.1701	-0.0042	0.1465	-0.0199	0.1090
4	Mental Health Expenditure (SUS)	0.5146	0.4693	0.1040	0.1020	-0.1949	-0.0201	0.0183	0.4550
5	Centres Psychosocial Care (6 + 7 + 8 + 9)	**0.8017**	0.3252	0.0555	0.1295	0.0092	0.0472	-0.0105	0.2292
6	General Practitioner (physician)	**0.9064**	0.0423	-0.0780	-0.2442	0.0810	-0.1135	-0.0095	0.0914
7	Paediatrician (physician)	**0.9455**	-0.0972	0.1398	-0.0961	0.0001	-0.1652	0.0398	0.0389
8	Psychiatrist (physician)	**0.8768**	0.1845	-0.3724	-0.0966	-0.0637	0.0195	0.0322	0.0438
9	Psychologist	**0.9569**	0.1118	-0.0480	0.0483	-0.0013	-0.1086	-0.0771	0.0495
10	Social Worker	**0.8851**	-0.2568	0.1048	0.2929	0.0512	-0.0620	-0.0119	0.0473
11	Nurse	**0.9771**	-0.1851	-0.0172	0.0351	-0.0352	0.0590	-0.0220	0.0043
12	Nursing Assistant	0.5415	0.2970	0.2652	-0.0439	0.2259	0.0745	-0.0085	0.4897
13	Nursing Technician	**0.9475**	-0.2376	-0.0747	-0.0309	-0.1160	0.0784	-0.0459	0.0175
Production: by the authors, 2019.									

Table 8
Quantity of Municipality with Expenditure with CAPS (SUS) by Region

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ% (2008–2017)
North	15	15	23	28	35	39	53	59	65	63	320%
Northeast	131	140	105	140	180	230	287	318	302	333	154%
Southeast	86	87	72	83	111	148	160	185	194	199	131%
South	49	52	57	68	81	106	112	123	135	138	182%
Midwest	22	22	17	44	40	40	37	41	44	50	127%
Total	303	316	274	363	447	563	649	726	740	783	158%
Production: by the authors, 2019.											

Table 9
Quantity of Municipality with Expenditure with CAPS (SUS) by Strata

Classification	Strata	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ% (2008–2017)
Very small	Pop. ≤15,000	16	18	16	49	42	49	55	73	80	96	500%
Small	15,000 < pop. ≤20,000	16	24	24	33	34	51	70	82	82	96	500%
Small-medium	20,000 < pop. ≤70,000	154	161	142	170	242	323	359	404	414	422	174%
Medium	70,000 < pop. ≤200,000	79	75	65	78	94	98	120	119	118	119	51%
Medium-large	200,000 < pop. ≤1 million	36	36	25	28	31	38	41	44	42	45	25%
Large	Pop. >1 million	2	2	2	5	4	4	4	4	4	5	150%
Total		303	316	274	363	447	563	649	726	740	783	158%
Production: by the authors, 2019.												

Table 10
Mental Health (SUS) Expenditure (R$) by Region (municipality total)

Year	North	Northeast	Southeast	South	Mid-West	Total
2008	5,717,698.6	71,881,130.4	34,580,166.9	15,816,723.0	5,860,651.2	133,856,370.1
2009	6,231,036.8	44,728,350.6	32,120,221.0	20,573,800.9	8,009,172.2	111,662,581.4
2010	7,825,724.2	42,799,037.6	33,345,686.6	26,452,955.5	6,957,993.6	117,381,397.5
2011	9,919,489.0	54,924,876.4	33,902,970.1	31,168,736.0	9,940,699.5	139,856,771.0
2012	11,780,723.3	68,914,570.9	56,606,516.7	31,343,966.1	12,551,337.8	181,197,114.7
2013	11,741,053.2	85,014,537.3	100,288,130.5	46,283,864.5	14,573,901.6	257,901,487.0
2014	21,917,832.0	133,222,484.9	148,070,125.9	62,094,501.5	16,067,477.5	381,372,421.8
2015	24,107,488.5	158,099,930.0	163,396,760.6	85,950,327.2	19,793,738.3	451,348,244.6
2016	29,806,765.1	150,615,696.1	172,971,853.1	95,241,212.8	22,021,415.8	470,656,942.9
2017	28,367,725.1	157,706,856.6	183,254,284.9	84,555,735.7	21,441,239.1	475,325,841.3
Δ% (2008–2017)	396%	119%	430%	435%	266%	255%

Production: by the authors with use of the Brazil's Central Bank calculator (Bacen), 2019. Broad Consumer Price Index (IPCA) of the Brazilian Institute of Geography and Statistics (IBGE), Constant Prices of 2017 R$.

Table 11
Mental Health (SUS) Expenditure (R$) by Strata (municipality total)

	Very small	Small	Small-medium	Medium	Medium-large	Large	Total
Strata	Pop. ≤15,000	15,000 < pop. ≤20,000	20,000 < pop. ≤70,000	70,000 < pop. ≤200,000	200,000 < pop. ≤1 million	Pop. >1 million	
2008	8,167,327.7	7,565,239.7	53,107,513.6	34,350,365.8	30,229,696.4	436,226.8	133,856,370.1
2009	6,095,060.8	7,708,437.5	45,201,097.4	29,940,613.6	22,203,963.4	513,408.8	111,662,581.4
2010	4,756,478.1	6,540,243.5	44,541,723.5	29,580,417.4	31,751,862.4	210,672.5	117,381,397.5
2011	6,835,617.5	8,944,477.9	56,294,712.2	36,369,254.3	30,731,755.9	680,953.0	139,856,771.0
2012	6,994,282.8	7,516,736.6	69,632,973.5	46,193,363.7	33,580,680.5	17,279,077.6	181,197,114.7
2013	12,422,454.9	12,606,792.6	97,141,545.6	59,883,911.8	65,446,700.1	10,400,082.0	257,901,487.0
2014	14,876,972.3	17,927,599.5	132,439,573.3	98,912,521.3	109,071,543.3	8,144,212.1	381,372,421.8
2015	18,872,015.7	25,842,331.9	163,772,187.8	105,234,173.0	117,360,296.3	20,267,239.9	451,348,244.6
2016	23,311,819.4	24,946,318.4	167,456,710.8	110,828,412.3	121,125,111.1	22,988,570.9	470,656,942.9
2017	26,170,976.5	27,322,387.1	163,062,834.9	126,160,102.8	113,776,668.9	18,832,871.1	475,325,841.3
Δ% (2008–2017)	220%	261%	207%	267%	276%	4,217%	255%

Production: by the authors with use of the Brazil's Central Bank calculator (Bacen), 2019. Broad Consumer Price Index (IPCA) of the Brazilian Institute of Geography and Statistics (IBGE), cumulative index of 1.5577600 [2008–2015]. Constant Prices of 2017 R$.

Table 12
Quantity of CAPS by Region (municipalities)

Region	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ% (2008–2017)
North	66	78	92	112	127	145	156	171	182	182	176%
Northeast	503	564	619	669	729	773	862	932	965	997	98%
Southeast	537	553	613	659	731	791	880	948	1,003	1,053	96%
South	262	293	313	330	354	382	426	453	455	462	76%
Midwest	79	85	94	106	115	133	149	158	166	171	116%
Total	1,447	1,573	1,731	1,876	2,056	2,224	2,473	2,662	2,771	2,865	98%

Production: by the authors, 2019.

Table 13
Quantity of CAPS by Strata (municipalities)

Classification	Strata	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Δ% (2008–2017)
Very small	Pop. ≤15,000	42	42	46	47	58	63	106	155	181	201	379%
Small	15,000 < pop. ≤20,000	69	82	92	111	123	143	180	215	229	241	249%
Small-medium	20,000 < pop. ≤70,000	538	617	694	760	834	909	1,007	1,069	1,104	1,127	109%
Medium	70,000 < pop. ≤200,000	300	327	366	389	423	457	494	513	533	549	83%
Medium-large	200,000 < pop. ≤1 million	320	325	339	356	382	400	419	436	444	461	44%
Large	Pop. >1 million	178	180	194	213	236	252	267	274	280	286	61%
Total		1,447	1,573	1,731	1,876	2,056	2,224	2,473	2,662	2,771	2,865	98%
Production: by the authors, 2019.												

Figures

Figure 1

Brazilian Mental Health Care Network Source: Brazilian Federal Court accounts (2012), adapted by Brazilian Health Minister 25 Elaboration: Adapted by authors. FHP: Family Health Program (Programa Saúde da Família-PSF). CHAP: Community Health Agent Program (Programa de Agentes Comunitários de Saúde-PACS).

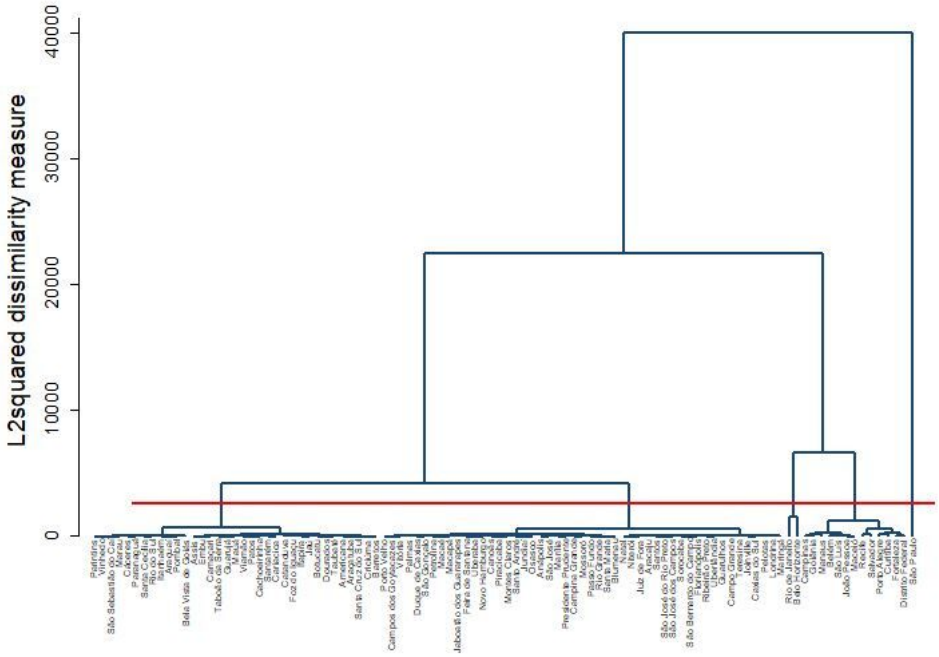

Figure 2

Dendrogram for Ward Cluster Analysis The colours are: dendrogram line is blue and cut line is red. Production: by the authors, 2019.

Image not available with this version

Figure 3

Mental Health (SUS) Expenditure (R$) (municipality total) Source: Information System on Public Health Budgets - ISPHB (Sistema de Informação sobre Orçamentos Públicos em Saúde-SIOPS). Elaboration: by authors, 2019.

Figure 4

Number of Cities by Cluster Production: by the authors, 2019.

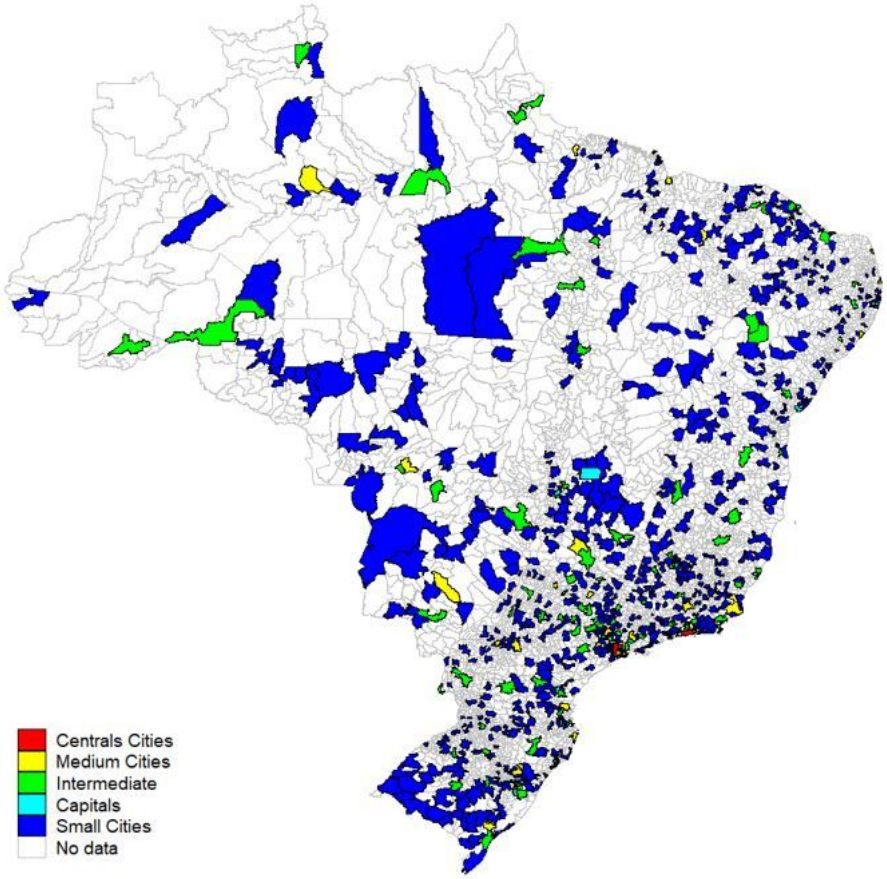

Figure 5

Brazilian map with Cluster K-means (rainbow), 2017. Production; by the authors, 2019. Note: The designations employed and the presentation of the material on this map do not imply the expression of any opinion whatsoever on the part of Research Square concerning the legal status of any country, territory, city or

area or of its authorities, or concerning the delimitation of its frontiers or boundaries. This map has been provided by the authors.