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## Investment of financial resources for the procurement of medicines for primary care in Brazilian municipalities

Marcela Amaral Pontes <sup>1</sup>  
Noemia Uruth Leão Tavares <sup>1</sup>  
Priscila Maria Stolses Bergamo Francisco <sup>2</sup>  
Janeth de Oliveira Silva Naves <sup>1</sup>

**Abstract** *This study shows a descriptive data analysis related to the procurement of medicines for primary care in Brazilian municipalities, as recorded in the National database of Pharmaceutical Service Actions and Services for the period July 2013 – June 2014, by geographic region and population size. Nine hundred and sixty municipalities were analyzed, of which 27% invested monetary value equal to or greater than the minimum statutory recommendations and 43% of these are located in the Southeast. The North region has the highest number of municipalities with less investment. Municipalities with a population over 500,000 inhabitants used, on average, lower resources to provide more items to users. The average number of items purchased was 86 and represents 25% of the National List of Essential Medicines (Rename); 64% had a decentralized resource management and the most commonly used procurement method was “tender”. The most purchased drugs are in line with the most prevalent primary care diseases. Findings showed that most municipalities invests below statutory recommendations and are located mainly in the North, Northeast and Midwest. It was not possible to establish a trend between population and amount invested per capita/year.*

**Key words** *Pharmaceutical Service, Health expenditure, Primary care, Healthcare financing*

<sup>1</sup> Faculdade de Ciências da Saúde, Universidade de Brasília. Cidade Universitária, Asa Norte. 70910-900 Brasília DF Brasil. apmarcela@gmail.com

<sup>2</sup> Faculdade de Ciências Médicas, Universidade Estadual de Campinas. Campinas SP Brasil.

## Introduction

After more than two decades of pharmaceutical services actions centralized in the Ministry of Health (MS), the first Brazilian drug policy approved in 1998 brought in its guidelines the re-orientation of pharmaceutical services based on decentralization and practices that proposed the promotion of access to and rational use of drugs<sup>1</sup>. The National Drug Policy paved the way to the financing decentralization process and pharmaceutical services actions in the Unified Health System (SUS).

In 1999, the MS created the Incentive to Basic Pharmaceutical services (IAFB) and established criteria to enable states and municipalities to receive financial resources from the three spheres of government for the procurement of medicines for primary care<sup>2</sup>.

Subsequently, the financing block for pharmaceutical services was organized into three components: basic, strategic and specialized<sup>3</sup>. The basic component provides resources for the costing of drugs for prevalent and priority health problems; the strategic component finances products for the treatment and control of endemic diseases and ailments; and the specialized component supplies drugs for some diseases whose diagnostic criteria are defined in the Clinical Protocols and Therapeutic Guidelines (PCDT)<sup>4</sup>.

Since then, funding for the Pharmaceutical services Basic Component (CBAF) has been consolidated through Ordinances aimed at reducing inequities and increasing funds<sup>5,6</sup>.

With the Health Pact, it was agreed that all SUS management spheres are responsible for promoting the structuring of pharmaceutical services and ensuring the population's access to medicines, promoting their rational use and observing established norms and agreements<sup>7</sup>.

More recently, universal and equal access to pharmaceutical services was reaffirmed through Decree N° 7.508, of June 28, 2011, which regulates Law No. 8.080/1990, to provide for the organization of the SUS, health planning, health care and interfederative coordination<sup>8</sup>.

The National Primary Care Policy published in 2012 defines that ensuring pharmaceutical services is one of the actions that should be included in the project to deploy teams and the Family Health Support Centers (NASF)<sup>9</sup>.

Currently, the financing of the CBAF is established in Ordinance GM/MS N° 1.555, of July 30, 2013, and the minimum amount to be invested

by the three spheres of government is R\$ 9.82 per inhabitant per year per municipality, with R\$ 5.10 paid by the Federal Government, R\$ 2.36 invested by the states and R\$ 2.36 by the municipalities. Of this total, municipalities can use 15% of the municipal and state counterparts in the structuring of pharmaceutical services. The National List of Essential Medicines (RENAME) is the guideline list for defining the drug list financed with this resource<sup>10</sup>.

Despite development of regulatory frameworks for pharmaceutical services in primary care, there are still countless challenges to its structuring. According to Oliveira *et al.*<sup>11</sup>, many factors compromise the quality of pharmaceutical services in Brazilian municipalities, among them the lack of financial resources.

Studies<sup>12-14</sup> have demonstrated the trend of drug expenditure in the country, but due to the limited access to procurement and consumption data, the evaluation of the pharmaceutical services financing model in Brazil is still incipient.

In 2013, the MS created the National Database of Pharmaceutical services Actions and Services in the SUS (BNDAF) aiming at providing information on the management of pharmaceutical services to assist decision-making of managers and health professionals<sup>15</sup>.

Based on these data, this study aims to analyze the financial value invested per inhabitant / year in Brazilian municipalities for the procurement of CBAF drugs, according to population size and geographic region, and to contribute to the discussion on the financing of pharmaceutical services in primary care.

## Methodology

This is a descriptive, retrospective cross-sectional study with data from the National Database of Pharmaceutical Services Actions and Services in the SUS (BNDAF)<sup>15</sup>, consisting of a set of data referring to the Basic Component of Pharmaceutical Services registered in Hórus – National Pharmaceutical Services Management System<sup>16</sup> or sent through a web service by the Brazilian municipalities.

The study's collected data from the period July 2013-June 2014 and records of procurement containing drugs and supplies from Annexes I and IV of RENAME 8<sup>th</sup> edition<sup>17</sup>, referring to the CBAF were considered. The following data were collected: geographic region; state; municipality; population; name of drug or supply; quantity pur-

chased in a pharmaceutical facility; product unit value; management model and acquisition mode, according to Law N° 8.666, of June 21, 1993<sup>18</sup>.

Municipalities with a year or more of records in the BNDAF were selected to define the sample, and those that recorded procurement data with no monetary value of the products purchased were excluded, which generated a per capita/year value of R\$ 0.00 for the studied period.

Of the municipalities selected, records containing MS centralized drugs procurement, products recorded as donation and items whose unit value multiplied by the quantity purchased was higher than the total annual resource that the municipality should have to purchase medicines and CBAF supplies were excluded. The latter were considered as systems' feeding errors.

The calculation of the value invested per inhabitant / year was based on the sum of the recorded acquisitions, divided by the population of the municipality, used for the transfer of funds for pharmaceutical services in primary care, based on the estimate made by the Brazilian Institute of Geography and Statistics (IBGE) in 2009 and 2011, as set forth in Ordinance GM/MS N° 1.555/2013<sup>10</sup>.

Descriptive analyses were made of expenses with the procurement of medicines in monetary values – means and the respective standard deviations, medians and coefficient of variation – as well as the distribution of absolute and relative frequencies by geographical region, state and population size.

The relationships between the variables considered in the study were verified through Spearman's correlation coefficient. The Kruskal-Wallis test with a significance level of 5% was employed in the comparison of the financial value applied per inhabitant / year, according to management models and regions.

For the definition of the most acquired drugs, the quantity acquired in all the municipalities was added and, according to it, drugs were classified from the most acquired to the least acquired in descending order. Drugs were grouped according to the main group of Anatomical Therapeutic Chemical (ATC) classification system, which corresponds to the organ or system in which the substance acts<sup>19</sup>.

The simple mean and standard deviation of unit acquisition values were calculated and the weighted average of acquisitions recorded in the Health Price Bank (BPS) in the period 28/03/2013-28/09/2014 was used for comparison purposes, extracted through the item report by

a Ministry of Health program. All analyses were performed through statistical package SPSS 20.

## Results

Records referring to the procurement of medicines and supplies of the CBAF in 1,801 municipalities were identified from BNDAF's data. Of these, 841 were excluded because they did not have at least one year of data recording that included the period July 2013-June 2014. Therefore, CBAF's items acquisition data in 960 municipalities were analyzed to perform this study.

The distribution of municipalities by population size in the five geographic regions and 25 states of the country, as well as the mean and median financial value applied per inhabitant / year and the mean purchased items are shown in Table 1.

When observing the distribution of municipalities by population size, we found that most (52.6%) has a population between 10 and 50 thousand inhabitants. There is a great variability in relation to the mean values of municipal acquisitions per inhabitant / year, regardless of population size. However, those with population above 500 thousand inhabitants show more homogeneous data compared to other population brackets. This study also found no correlation between the population and the amount applied per inhabitant / year ( $r_s = 0.038$ ,  $p = 0.244$ ) (data not shown in the table).

When analyzing the results, it was observed that the sample stratified by population size is heterogeneous and that there is a well-established trend between the population and the amount invested per inhabitant / year. Municipalities with a population of more than 500,000 inhabitants used, on average, less resources (R\$ 6.43) to provide more items for users' access. On the other hand, municipalities with a population between 100 and 500 thousand inhabitants had an average expenditure higher than the minimum recommended, but, according to Table 1, expense was lower when checking the median. In relation to the number of items purchased, it was verified that the larger the population size, the higher the mean number (Table 1).

Table 2 shows the average value per inhabitant per year, by geographic region and state, as well as the classification of municipalities according to management model.

When classifying data by geographic region, it was noticed that the sample remains hetero-

**Table 1.** Distribution of Brazilian municipalities (N = 960), by population size, by mean financial value invested per inhabitant/year, coefficient of variation, median and average number of purchased items. Brazil, July 2013-June 2014.

Population (inhabitants)	N° of municipalities	N° of states	N° of geographical regions	Mean purchase value per inhabitant/year (R\$) ± SD	CV	Median value (R\$)	Average number of purchased items
Less than 5,000	147	16	5	9.11 ± 13	1.41	5.44	62
5,001 to 10,000	185	21	5	9.26 ± 19	2.00	4.55	72
10,001 to 20,000	281	22	5	9.38 ± 17	1.76	4.71	84
20,001 to 50,000	226	23	5	8.57 ± 17	1.98	5.34	94
50,001 to 100,000	72	17	5	8.79 ± 9	1.08	6.86	115
100,001 to 500,000	37	16	5	11.18 ± 13	1.14	7.47	139
500,000+	12	09	4	6.43 ± 6	0.96	4.56	142
Total	960	25	5	8.67 ± 14	1.59	5.22	86

Data source: BNDAF. SD: Standard Deviation; CV: Coefficient of Variation.

geneous. The municipalities of the Southeast region, on average, invested a higher acquisition value per capita / year and acquired more items than municipalities of the other regions. This value was also higher than the minimum defined in the current legislation, but the median value was lower.

It was also observed that the mean and median values of municipal acquisitions in the in the other regions of the Country were smaller than set forth in the current Ordinance.

In detailing these data by state, we found an average per capita / year acquisition value greater than R\$ 9.82 in the states of Paraná, Rio Grande do Sul, Acre, Ceará and Mato Grosso do Sul, as well as states of Southeast. The median expenditure higher than the Ordinance was identified in more than 50% of the municipalities of Rio de Janeiro (Table 2).

Regarding the management model, it was observed that 611 (64%) municipalities have a decentralized CBAF resource management, that is, the procurement of drugs and supplies was performed directly by the municipality. In the South, Southeast and Northeast regions, there were states responsible for acquiring primary care items, but it was not possible to ascertain a relationship between the lowest mean value in municipalities with the state-centralized management model (Table 2).

Figure 1 shows the distribution of the sample by population size and geographic region, by average value of acquisition per inhabitant / year

invested. It shows that 700 (73%) municipalities invested less than R\$ 9.82 per capita / year, of which 453 (47%) have less than 20,000 inhabitants. Furthermore, according to the proportionality of the sample, the North region has the largest number of municipalities with the lowest investment, followed by the Northeast and Midwest regions.

When checking the medicines procurement mode reported by municipalities, it was noticed that, among those who registered this data (n = 534), most (76%) indicated “tender” as the most frequent, followed by “price quotation” (6%), “competition” (2%) and “invitation” (less than 1%). It is noteworthy that 15% recorded “waiver of bidding” as the most used procurement mode.

When analyzing the average unit value of the 20 most purchased drugs and supplies in a pharmaceutical facility, 95% of these items are priced above the mean recorded in BPS, in the period 28/03/2013-28/09/2014 (Table 3).

Of the 20 most purchased items by the municipalities of the sample, half (50%) were used for cardiovascular system-related problems, 20% for diabetes treatment and monitoring, 15% for nervous system, 10% analgesics and 5% for proton pump inhibitors (Table 3).

When calculating the mean unit value of the five most purchased items, by population size, it was found that the average unit price is lower in municipalities with a population greater than 50,000 inhabitants, with the exception of Losartan potassium 50 mg, which had a mean unit

**Table 2.** Distribution of Brazilian municipalities (N = 960) by geographic region and by state, according to the financial value of the acquisitions and management model. Brazil, July 2013 - June 2014.

Geographic regions and states	N° of municipalities and representation % in the state N (%)	Mean purchase value per inhabitant/year (R\$) ± SD	CV	Median Value (R\$)	Average number of purchased items	Management Model (N)		
						S	M	S/M
Midwest	73	7.70 ± 8	1.04	6.27	88	-	73	-
Goiás	41 (17)	6.44 ± 6	0.93	4.88	78	-	41	-
Mato Grosso do Sul	10 (13)	10.09 ± 8	0.79	8.49	107	-	10	-
Mato Grosso	22 (16)	8.96 ± 10	1.12	6.78	99	-	22	-
Northeast	546	8.11 ± 15	1.85	4.77	86	191	355	-
Alagoas	87 (85)	7.31 ± 10	1.37	5.79	102	-	87	-
Bahia	101 (24)	6.41 ± 9	1.40	3.09	74	73	28	-
Ceará	120 (66)	13.88 ± 26	1.87	9.02	129	118	2	-
Maranhão	2 (1)	4.71 ± 3	0.64	4.71	112	-	2	-
Paraíba	62 (28)	7.17 ± 12	1.56	4.03	66	-	62	-
Pernambuco	65 (35)	8.29 ± 13	1.57	3.75	77	-	65	-
Piauí	14 (6)	3.64 ± 5	1.37	1.78	48	-	14	-
Rio Grande do Norte	79 (47)	4.25 ± 7	1.65	1.49	54	-	79	-
Sergipe	16 (21)	6.11 ± 7	1.15	3.72	80	-	16	-
North	92	6.95 ± 10	1.44	3.86	76	-	92	-
Acre	2 (9)	10.11 ± 7	0.69	10.11	42	-	2	-
Amazonas	2 (3)	4.40 ± 1	0.23	4.40	96	-	2	-
Pará	24 (17)	4.46 ± 5	1.12	2.58	88	-	24	-
Rondônia	10 (19)	8.99 ± 7	0.78	6.68	17	-	10	-
Roraima	1 (7)	5.58	-	5.58	88	-	1	-
Tocantins	53 (38)	7.69 ± 12	1.69	3.28	63	-	53	-
Southeast	111	12.21 ± 14	1.15	7.96	94	3	56	52
Espírito Santo	18 (23)	12.27 ± 13	1.06	9.02	86	-	18	-
Minas Gerais	4 (0.5)	12.57 ± 19	1.51	3.28	111	3	1	-
Rio de Janeiro	25 (27)	16.45 ± 21	1.28	13.22	92	-	25	-
São Paulo	64 (10)	10.52 ± 11	1.05	7.44	97	-	12	52
South	138	9.72 ± 12	1.23	5.71	79	103	35	-
Paraná	103 (26)	9.93 ± 13	1.31	5.60	77	103	0	-
Rio Grande do Sul	22 (4)	11.12 ± 11	0.99	7.37	81	-	22	-
Santa Catarina	13 (4)	5.75 ± 5	0.87	4.94	90	-	13	-
Total	960	8.67 ± 14	1.61	5.22	86	297	611	52

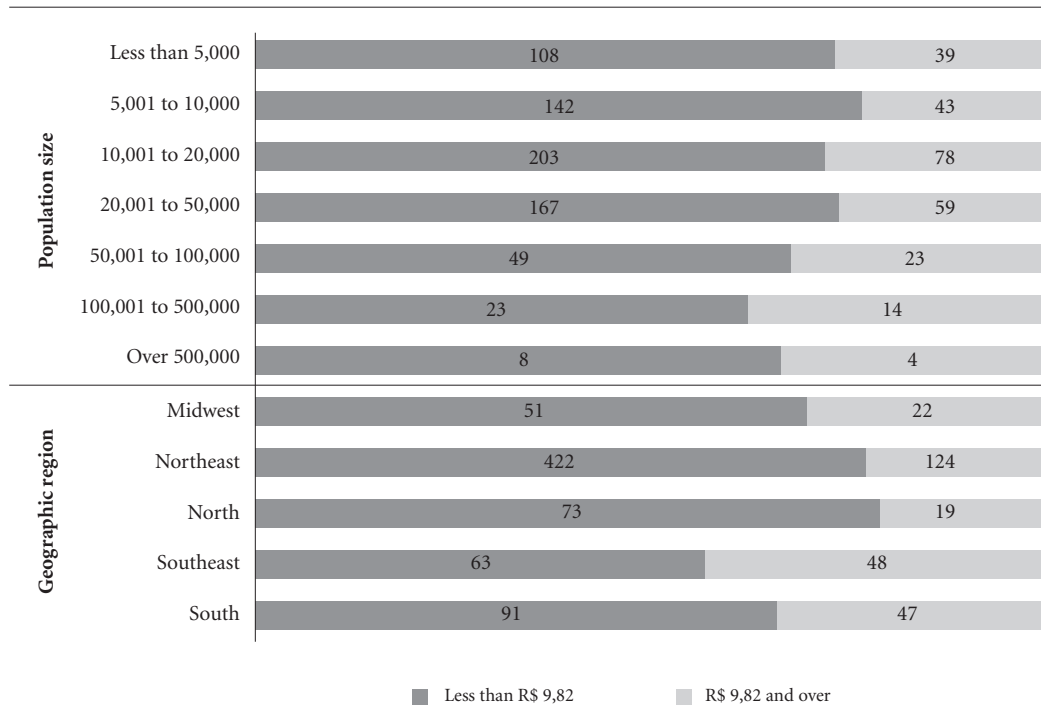
Data source: BNDAF.

SD: Standard Deviation; CV: Coefficient of de variation; S = state-centralized medicines procurement; M = decentralized procurement in the municipality; S/M = part of the procurement done by the state and part by the municipality.

price variation of 654%, and it was not possible to establish a relationship between the mean unit value and the population size for that drug. It was also observed that municipalities with 5 to 10,000 inhabitants acquired medicines for a mean unit value lower than municipalities with 10 to 50,000 inhabitants. (Table 4).

## Discussion

The present study analyzed the financial value applied per inhabitant per year in 17% of the Brazilian municipalities for the procurement of medicines and supplies of the CBAF and identified differences between population sizes, geographic regions, management model, number of items purchased, average unit value of items and types of bid proceedings.



**Figure 1.** Distribution of Brazilian municipalities (N = 960), by population size, geographical region and CBAF minimum funding value. Brazil, July 2013-June 2014.

Data source: BNDAF.

Note: The minimum value defined in Ordinance N° 1.555/2013 for CBAF financing is R\$ 9.82 per inhabitant per year.

Most of the municipalities applied a financial value below that recommended by the current legislation. Several factors may be related to this fact, among them are the non-application of state and/or municipal counterpart; state and/or municipal counterparts in disagreement with the agreement; lack of inventory control or shortcomings, leading to procurement of quantities greater or less than needed<sup>20</sup>. Another factor that may be influencing the total value applied per inhabitant / year is the resource management model, which must be agreed upon at the Bipartite Interagency Commission (CIB). In this study, it was verified that municipalities with a municipality-decentralized management of basic pharmaceutical services invest, on average, less than the municipalities with total or partial state-centralized management.

Municipalities have sought strategies to make financing of pharmaceutical services in primary care more effective and safe, such as procurement via intermunicipal consortia and qualification of

the procurement process<sup>13,21,22</sup>. A study<sup>21</sup> pointed out that the use of a consortium for the purchase of medicines led to a reduction in the shortage of products, an expressive saving of resources and, through the contract for the registration of prices, made it possible to rationalize the use of the budget in a municipality of Santa Catarina. According to Amaral and Blatt<sup>22</sup> the adhesion of the municipalities of Paraná to the consortium for the procurement of medicines reduced costs, thus ensuring a greater supply of medicines and curbing the Basic Pharmaceutical Services component's supply shortcomings. Prices paid in 2008 for the purchase of medicines per unit, now under the influence of the consortium, were systematically lower than in 2007 (63% of items). When comparing 2009 unit values with the procurement of medicines through consortium with 2007 values, unit values were lower for 76% of the items<sup>13</sup>.

In this study, differences in per capita spending were identified between the population sizes and one of the hypotheses for this situation

**Table 3.** Mean unit value of the most purchased CBAF items, in a pharmaceutical facility, by the Brazilian municipalities. Brazil, July 2013 - June 2014.

Medicines	Mean unit value (R\$ ± SD)*	BPS mean unit value** (R\$)
Cardiovascular system		
Captopril 25 mg tablet (1 <sup>st</sup> )	0.15 ± 1.5	0.04
Hydrochlorothiazide 25 mg tablet (2 <sup>nd</sup> )	0.13 ± 1.6	0.02
Losartan potassium 50 mg tablet (4 <sup>th</sup> )	0.17 ± 1.6	0.07
Propranolol, hydrochloride 40 mg tablet (7 <sup>th</sup> )	0.12 ± 1.3	0.02
Enalapril maleate 20 mg tablet (11 <sup>th</sup> )	0.38 ± 3.5	0.06
Simvastatin 20 mg tablet (14 <sup>th</sup> )	0.13 ± 0.3	0.05
Atenolol 50 mg tablet (15 <sup>th</sup> )	0.14 ± 1.5	0.03
Amlodipine besylate 5 mg tablet (18 <sup>th</sup> )	0.07 ± 0.4	0.03
Furosemide 40 mg tablet (19 <sup>th</sup> )	0.16 ± 1.7	0.03
Alimentary tract and metabolism		
Glibenclamide tablet 5 mg (3 <sup>rd</sup> )	0.10 ± 1	0.01
Omeprazole 20 mg pill (6 <sup>th</sup> )	0.36 ± 3	0.04
Metformin, hydrochloride 850 mg tablet (8 <sup>th</sup> )	0.45 ± 5.6	0.05
Metformin, hydrochloride 500 mg tablet (16 <sup>th</sup> )	0.14 ± 1.3	0.05
Inputs		
Reagent strip to measure capillary glycaemia (17 <sup>th</sup> )	6.63 ± 19.7	0.19
Blood and blood forming organs		
Acetylsalicylic acid 100 mg tablet (5 <sup>th</sup> )	0.13 ± 1.6	0.02
Musculo-skeletal system		
Ibuprofen 600 mg tablet (13 <sup>th</sup> )	0.31 ± 3	0.09
Nervous system		
Amitriptyline, hydrochloride 25 mg tablet (9 <sup>th</sup> )	0.35 ± 3	0.41
Carbamazepine 200 mg tablet (10 <sup>th</sup> )	0.37 ± 4.3	0.12
Fluoxetine, hydrochloride 20 mg pill (12 <sup>th</sup> )	0.35 ± 3.2	0.09
Paracetamol 500 mg tablet (20 <sup>th</sup> )	0.22 ± 2.07	0.04

Data source: BNDAF and BPS.

Notes: \*The sum of the quantity acquired in all municipalities was performed, items were classified in descending order, that is, from the most acquired to the least acquired, and the simple mean and standard deviation of the unit acquisition values were calculated. \*\* BPS mean unit value considers the weighted average.

**Table 4.** Unit purchase value of the five most acquired CBAF's items, by population size of the Brazilian municipalities. Brazil, July 2013 - June 2014.

Population size	Mean unit value (R\$)				
	Acetylsalicylic acid 100 mg tablet	Captopril 25 mg tablet	Glibenclamide tablet 5 mg	Hydrochlorothiazide 25 mg tablet	Losartan potassium 50 mg tablet
Less than 5,000	0,17 ± 1,61	0,40 ± 2,80	0,58 ± 3,46	0,67 ± 4,33	0,36 ± 2,46
5,001 to 10,000	0,05 ± 0,41	0,08 ± 0,53	0,03 ± 0,04	0,03 ± 0,05	0,11 ± 0,36
10,001 to 20,000	0,18 ± 1,82	0,16 ± 1,24	0,06 ± 0,47	0,08 ± 0,50	0,13 ± 0,57
20,001 to 50,000	0,21 ± 2,36	0,17 ± 1,90	0,03 ± 0,07	0,09 ± 1,10	0,07 ± 0,10
50,001 to 100,000	0,02 ± 0,02	0,02 ± 0,02	0,03 ± 0,11	0,03 ± 0,05	0,46 ± 4,32
100,001 to 500,000	0,03 ± 0,08	0,02 ± 0,02	0,02 ± 0,02	0,03 ± 0,04	0,09 ± 0,15
500,000+	0,03 ± 0,06	0,03 ± 0,04	0,02 ± 0,02	0,02 ± 0,02	0,14 ± 0,14

Data source: BNDAF.



would be the acquisition in scale, which allows for better price negotiation. Marin *et al.*<sup>23</sup> recommend that public administrations create mechanisms that allow them to expand their procurement scale by using consolidated purchases, through acquisitions over a longer period of time – 12 months, for example – associations or consortia between several institutions, processing the purchases jointly.

There was also an uneven investment of resources among geographic regions, as shown by the higher mean investment in the Southeast and South regions, which are the most economically active and industrialized regions in Brazil<sup>24</sup>. The hypothesis that may be related to this difference is access to health services. A study<sup>25</sup> shows that federal expenditure per inhabitant, in a specialized outpatient clinic, hospital care and pharmaceutical services were higher in the Southeast and South regions, followed by the Midwest, with lower expenditure in the Northeast and North, thus reflecting the uneven supply and use of health services in the country.

Another aspect observed was the procurement mode used by municipalities. This study found that “tender” was the most commonly informed mode by most municipalities that recorded this data. Merisio *et al.*<sup>21</sup> verified that, according to respondents, choosing face-to-face tender mode for the procurement of medicines, along with the price registration are enabling a greater level of savings for the municipal public administration.

However, the percentage of municipalities that used the bidding waiver more often and the number of municipalities that did not register this data is relevant and leads to a reflection on the quality of the drug acquisition process in Brazilian municipalities. A study<sup>26</sup> published in 2014 indicates that 52.7% of municipalities in Paraíba detected “non-compliance with drug purchase regulations”, which is one of the main flaws or irregularities found in public tenders. In addition, 29.1% of the municipalities reported the “fractionation of expenses for the purchase of medicines”, which is characterized by dividing the estimated expenditure with a view to carrying out direct contracting or using a bidding modality less complex than that provided by law.

Regarding the average number of items purchased by the municipalities, it was observed that, in relation to RENAME 8<sup>th</sup> edition, 25% of the items on this list were purchased. This percentage is slightly higher (35%) compared to the number of items available in the National Ref-

erence List (ERN) of Ordinance N<sup>o</sup> 4217/2010, effective until July 2013. RENAME 8<sup>th</sup> edition listed 348 items for procurement and ERN 245 decentralized procurement items. It is worth remembering that the list of medicines of municipalities must always consider the local / regional epidemiological profile, and it is not mandatory to make available all CBAF's medicines.

In relation to the unit values of the CBAF products most acquired by the municipalities of the sample, compared to the population size and the mean unit value shown in the BPS, it is worth noting that there is a need to carry out a more detailed analysis to identify factors involved in price differences shown. In any case, it is important to note that the results found in most municipalities show that the items purchased are above the price presented in the BPS, and that the value applied per inhabitant / year by them is lower than the minimum established by current legislation, Which can lead to great losses for the access to medicines in the assisted population.

When analyzing the pharmacological classes of the most acquired drugs, it was verified that cardiovascular drugs, oral antidiabetic drugs and drugs for the nervous system were predominant. These groups of drugs treat some of the most prevalent diseases in the Brazilian population, as observed in national literature<sup>27,28</sup>.

Some limitations in this study should be considered. The methodology used only the list of medicines geared to the CBAF, from RENAME 8<sup>th</sup> edition, to define the financial value per inhabitant / year, which may result in underestimated figures, since municipalities can purchase other medicines for primary care with their own resources. The use of 15% of the state and municipal resources to structure pharmaceutical services was not considered, an amount that changes the minimum value to be invested for the procurement of medicines and supplies by the municipalities. Data omission and the eventual feeding of information systems are also limiting factors, since the obligation to send data to BNDAP on a continuous basis is determined for a small part of the Brazilian municipalities.

Despite limitations, this study shows unprecedented and comprehensive results that cover the entire national territory. Regional and demographic differences in the investment of financial resources indicate the uneven availability of drugs and bring as a reflection the importance of a new discussion of basic pharmaceutical services's financing model and the responsibility of SUS spheres in the efficient management of these

resources. Therefore, the strategy of reassessing resources for pharmaceutical services in primary care, according to criteria that consider regional and demographic differences found in this study, can be a first step towards further discussion of the financing model.

BNDAF's data review also reveals that there are still few municipalities that use pharmaceutical services information systems provided by the

Federal Government. The non-mandatory use of information systems hinders the monitoring of the implementation of pharmaceutical services, since there is insufficient data to generate adequate information to evaluate the financing model and to produce pharmaceutical services results indicators in the country, also influencing the monitoring of access and availability of medicines to the population.

## Collaborations

MA Pontes, JOS Naves and NUL Tavares contributed in the design and outline of the study, analysis and interpretation of the results and critical review of the intellectual content of the manuscript. PMSB Francisco contributed to the analysis and interpretation of the results. All authors participated in the writing, approved the final version of the manuscript and undertake responsibility for all aspects of the work, ensuring its accuracy and integrity.

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