

Comparative economic analysis between drugs available in primary health care and in the Popular Pharmacy Program of Brazil in a Brazilian capital

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Abstract

Objective: To compare public expenditures on medications distributed in Primary Health Care through the Brazilian Unified Health System (SUS) with those provided by the PFPB in the city of Porto Alegre, RS. **Methods:** A cross-sectional economic analysis was conducted by examining the items available through the Municipal List of Essential Medications (REMUME) for the year 2020 and extracting data from the local bidding processes. The calculation factor considered the annual value of committed medications and the annual structural and human resource costs associated with maintaining all stages of pharmaceutical care, from procurement to medication dispensation, as detailed in the municipal management report. PFPB costs, in Brazilian Reals and US Dollars per pharmaceutical unit, for the same items available in the SUS, were determined in accordance with Ministry of Health ordinances No. 2,898 of November 3, 2021, and No. 5 of September 28, 2017. **Results:** A total of 16 medications were selected, and the overall difference between the costs incurred by the Municipal Government of Porto Alegre (PMPA) and the estimated costs of the PFPB amounted to R\$ 6,503,221.20 (\$1,245,827.82), approximately 1.77 times the annual cost incurred by the PMPA for all stages of pharmaceutical care, from procurement to medication dispensation. Sodium alendronate 70 mg was found to be the primary contributor to the cost differential among access to medications. In terms of annual expenditures, simvastatin 20 mg was identified as the medication incurring the highest costs for both the PMPA and the PFPB. **Conclusion:** The study revealed higher medication expenditures through the PFPB. The variance in logistical stages of medication distribution could be redirected towards expanding pharmaceutical services and improving structural aspects in Primary Health Care, thereby contributing to Rational Medication Use. This, in turn, may result in reduced costs associated with the treatment of medication-related morbidities.

Keywords: primary health care; pharmaceutical services; drug costs.

Análise econômica comparativa entre medicamentos disponibilizados na atenção primária em saúde e no Programa Farmácia Popular do Brasil em uma capital brasileira

Resumo

Objetivo: Comparar os gastos públicos entre os medicamentos distribuídos na Atenção Primária em Saúde (APS) disponibilizados pelo Sistema Único de Saúde (SUS) com os fornecidos através do PFPB na cidade de Porto Alegre, no Rio Grande do Sul. **Metodologia:** Foi realizada um estudo transversal com análise econômica, por meio da consulta aos itens disponibilizados pelo SUS, na Relação Municipal de Medicamentos Essenciais (REMUME) de 2020 e dos dados extraídos da seleção dos processos licitatórios e fator de cálculo que considerou o valor anual de medicamentos empenhados e os custos estruturais e com recursos humanos anuais para a manutenção de todas as etapas da Assistência Farmacêutica (AF). Os custos do PFPB, em reais e dólares americanos, por unidade farmacotécnica, para os mesmos itens disponibilizados no SUS, foram definidos levando em consideração as portarias do MS nº 2.898, de 03/11/2021 e nº 5, de 28/09/2017. **Resultados:** Dezesesseis medicamentos foram selecionados e a diferença total entre a estimativa de custos do município e a do PFPB foi de R\$ 6.503.221,20 (\$ 1,245,827.82), o que representou 1,77 vezes o custo anual que o município teve com todas as etapas da AF, da aquisição à dispensação dos medicamentos. O alendronato de sódio 70 mg foi o responsável pela maior diferença entre os custos de acesso aos medicamentos. Em termos de gastos anuais, o medicamento que mais gerou gastos para ambas fontes analisadas foi a sinvastatina 20 mg. **Conclusão:** Verificou-se maior gasto com medicamentos do PFPB. Essa diferença de gastos nas etapas logísticas dos medicamentos poderia ser aplicada na expansão dos serviços farmacêuticos e melhorias estruturais na APS, contribuindo para a racionalização do uso de medicamentos, reduzindo o custo com o tratamento e a ocorrência de desfechos negativos relacionados aos mesmos.

Palavras-chave: atenção primária a saúde; serviços farmacêuticos; custos dos medicamentos.



Introduction

When the Unified Health System (SUS) was created by Law 8080/1990, principles were established that govern the program, such as universality, integrality and equality¹. Measures were also established such as the formulation of the National Medicine Policy (Política Nacional de Medicamentos, PNM), which aims to promote the rational use of medications, guarantee their safety, quality, and efficacy, as well as prioritizing access by the population to medications that are considered essential, with the adoption of the National List of Essential Medicines (Relação Nacional de Medicamentos Essenciais, RENAME)². As a result, one of the guidelines presented by the PNM was the reorientation of pharmaceutical care, based on Resolution 338/2004 of the National Health Council (Conselho Nacional de Saúde, CNS), which approved the National Pharmaceutical Care Policy (Política Nacional de Assistência Farmacêutica, PNAF), establishing that it should not be restricted to the acquisition and distribution of medications².

In the reorganization process, the financing of pharmaceutical care in primary care was adopted, which has a tripartite structure and includes the Union, the states (and the Federal District) and the municipalities³. Ordinance MS/GM No. 1,555 (2013), which sets out the rules for financing and implementing the Basic Component of Pharmaceutical Services (Componente Básico da Assistência Farmacêutica, CBAF) within the SUS, stated that the states, the Federal District and the municipalities are responsible for selecting, programming, acquiring, storing, controlling stock and expiry dates, distributing and dispensing the medications and supplies of the Basic Component of Pharmaceutical Services, listed in Annexes I and IV of the current RENAME⁴. Part of the funding is the Popular Pharmacy Program of Brazil (PFPB), coordinated by the Ministry of Health and the Oswaldo Cruz Foundation and started in 2004⁵, through its own network, in accordance with Law 10.858/2004, regulated by Decree 5.090/2004⁶.

The Accredited Private Retail Pharmacies (Aqui Tem Farmácia Popular, ATFP) program, created in 2006 through the accreditation of private community pharmacies and subsidized by the federal government, was introduced with the aim of providing medications to the population on a co-pay basis or free of charge in the case of diseases such as hypertension, diabetes and asthma through the Health is Priceless (Saúde Não Tem Preço, SNTP) campaign created in 2011⁵. In 2017, the pharmacies in the program's own network were closed with the premise of fully transferring the amount spent on their maintenance to the financing of Pharmaceutical Assistance, optimizing its resources and increasing investment in the purchase of essential medications⁵. This program aimed to expand access to medications in the country, in order to increase the reach of the low-income population, with limited access to SUS dispensaries and pharmacies for treatment of chronic diseases with a higher incidence⁷.

The formulation of programs with this objective is justified by the difficulty faced by the low-income population in obtaining access to essential medications. This difficulty results in low adherence, which is particularly worrying in the case of chronic diseases⁸.

According to the 2019 Thematic Budget for Access to Medicines, developed by the Institute for Socioeconomic Studies, spending on medications by the Ministry of Health in 2019 was R\$19.8 billion reais, more than double the amount recorded in 2008. In 2008, the CBAF spent R\$1.56 billion, while the PFPB spent R\$0.87 billion. In 2019, on the other hand, the CBAF spent R\$1.60 billion, compared to R\$2.35 billion for the PFPB. These figures lead us to

realize that spending on the PFPB has increased compared to the CBAF, which remained practically stagnant between these years⁹.

It is important to note that the literature presents few research results that include a comparative economic analysis between the medication provision in SUS Primary Health Care and those dispensed through the PFPB in Brazilian cities.

This study's objective was to compare public spending on medications dispensed in SUS Primary Health Care, considering all the stages of pharmaceutical care, with spending on dispensing medications from the Popular Pharmacy Program of Brazil in the city of Porto Alegre, Rio Grande do Sul.

Methods

This is a cross-sectional study with economic analysis. Access to data on the costs of medications distributed by Primary Health Care (PHC) was requested and made available by the Municipal Health Department in conjunction with the Pharmaceutical Assistance Coordination of Porto Alegre, and those relating to the PFPB were extracted from Ministry of Health Ordinance No. 2,898, of November 3, 2021, and also from Ordinance No. 5, of September 28, 2017, considering the state of Rio Grande do Sul as a reference.

The items made available by the municipality of Porto Alegre were checked in the latest version of the Municipal List of Essential Medications (Relação Municipal de Medicamentos Essenciais, REMUME), available at http://lproweb.procempa.com.br/pmpa/prefpoa/sms/usu_doc/remume2020.pdf, updated in 2020. Next, data was extracted by selecting the bidding processes located on the city hall portal website (<https://prefeitura.poa.br/>), through the Finance Department: bids and contracts, materials price registry, medical area and, finally, human medications. The public procurement portal was used to search for the process number on the city council's website, using the "Porto Alegre" filter in the "body" field. The medications selected for analysis were those listed both in REMUME and in the Ministry of Health's ordinances relating to the Popular Pharmacy Program in Brazil.

The logistical costs of operating a public pharmacy and purchasing the medications dispensed in 2022 were collected. Structural cost estimates included 10 District Pharmacies and the Pharmaceutical Supply Center (CAF). Current costs included human resources and other ordinary expenses (electricity, water, telephone, rent) for the 10 District Pharmacies, the CAF, pharmaceutical logistical support, the Pharmaceutical Assistance Coordination, and the pharmaceutical professionals included in the PHC.

For the CAF, since it shares its space with other services, the current costs related exclusively to the building were estimated at 24%, taking into account the proportion in m² it occupies in relation to the total building. The other costs related to medication logistics (transportation contract, driver and fuel) were considered in full.

With this data, a calculation factor was created that took into account the annual value of medications committed and the other estimated annual structural, running and human resources costs. In 2022, the annual cost was R\$26,368,879.62 in committed medications and R\$11,597,092.46 for the structural and running costs of maintaining pharmaceutical services, giving a total cost of R\$37,965,972.08. Based on this data, the total amount was divided by the annual cost of medications committed to, giving a calculated factor of 1.4398. For all the medications selected, their purchase



price was multiplied by the factor used to calculate the operating cost of Pharmaceutical Services, thus creating an equal metric for the services provided in the two types of strategic actions.

After collecting the data, economic analyses were carried out involving the values found for the respective medications on each list surveyed, the total annual cost of the two programs, as well as the difference and ratio between them. The annual cost was estimated using the PMPA's mean monthly consumption for each of the items.

The values obtained from the collection were converted from the Brazilian currency into dollars, using the American currency rate on December 30, 2022. The Central Bank of Brazil's currency converter was used to convert the values.

We did not consider how much families spent on purchasing PFPB medications under the co-participation system.

It was not necessary to submit the research project to the Human Research Ethics Committee since the data used is secondary and public, without any information from patients.

Results

Sixteen medications found in REMUME 2020 and in Ministry of Health ordinances No. 5/2017 and No. 2,898/2021 were selected and had their annual cost verified, as well as their difference and the ratio between them (Table 1).

Table 1. Comparison of spending per medication (in reais and dollars) made available by the Porto Alegre City Hall (PMPA) and by the Popular Pharmacy Program of Brazil (PFPB).

Medication	Value per pharmacotechnical unit (PFPB) ^a (R\$ - \$)	Value per pharmaceutical unit (PMPA) (R\$ - \$)	Annual PMPA consumption mean (pharmacotechnical units) ^b	Estimated annual PFPB cost (R\$ - \$)	PMPA Annual Cost (R\$ - \$) ^c	Difference between costs (R\$ - \$)	Ratio between PFPB cost / PMPA cost
Sodium alendronate 70 mg	1,87 - 0,36	0,18 - 0,034	147.691	248.120,88 - 47,532.73	37.468,20 - 7,177.82	210.652,68 - 40,354.92	6,62
Atenolol 25 mg ^d	0,10 - 0,019	0,06 - 0,011	2.904.130	290.413,00 - 55,634.67	250.882,37 - 48,061.76	39.530,63 - 7,572.92	1,16
Budesonide 32 mcg/dose - nasal topical administration	0,05 - 0,0096	0,08 - 0,0153	33.463	1.338,52 - 256.42	3.693,81 - 707.63	2.355,29 - -451.20	0,36
Captopril 25 mg	0,10 - 0,019	0,03 - 0,0057	7.733.468	773.346,80 - 148,150.73	334.039,94 - 639.92	439.306,86 - 84,158.40	2,32
Carbidopa 25 mg + levodopa 250 mg	0,64 - 0,12	0,77 - 0,15	225.419	130.743,02 - 25,046.55	249.910,26 - 47,875.53	-119.167,24 - -22,828.97	0,52
Benserazide hydrochloride 25 mg + levodopa 100 mg	1,17 - 0,22	1,39 - 0,27	150.565	158.093,25 - 30,286.06	301.264,48 - 57,713.50	-143.171,23 - -27,427.44	0,52
Metformin 850 mg	0,14 - 0,027	0,08 - 0,015	11.268.980	1.577.657,20 - 302,233.18	1.298.008,22 - 248,660.58	279.648,98 - 53,572.60	1,22
Propranolol 40 mg	0,08 - 0,015	0,04 - 0,0077	3.126.351	250.108,08 - 47,913.42	180.053,09 - 34,492.93	70.054,99 - 13,420.50	1,39
Beclomethasone dipropionate 250 mcg/dose, oral inhalation solution	0,21 - 0,040	0,09 - 0,017	54.044	11.349,24 - 2,174.18	6.769,70 - 1,296.88	4.579,54 - 877.31	1,68
Beclomethasone dipropionate 50 mcg/dose, oral inhalation solution	0,16 - 0,031	0,14 - 0,027	8.990	1.438,40 - 275.55	1.807,60 - 346.28	369,20 - -70.73	0,80
Glibenclamide 5mg	0,07 - 0,013	0,03 - 0,0057	4.884.438	341.910,66 - 65,500.13	210.978,74 - 40,417.38	130.931,92 - 25,082.74	1,62
Hydrochlorothiazide 25 mg	0,06 - 0,011	0,02 - 0,0038	10.992.143	659.528,58 - 126,346.47	364.009,78 - 69,733.67	295.518,80 - 56,612.80	1,81
Timolol maleate 0,50% - ophthalmic solution	0,48 - 0,092	0,51 - 0,098	12.795	5.501,85 - 1,053.99	9.321,67 - 1,785.76	3.819,82 - -731.77	0,59
Enalapril 10 mg	0,17 - 0,032	0,03 - 0,0057	23.047.581	3.918.088,77 - 750,591.72	995.518,77 - 190,712.41	2.922.570,00 - 559,879.31	3,94
Sinvastatin 20 mg	0,26 - 0,050	0,07 - 0,013	18.368.740	4.224.810,20 - 809,350.61	1.851.314,72 - 354,657.99	2.373.495,48 - 454,692.62	2,28
Salbutamol sulfate 100 mcg/dose	0,09 - 0,017	0,04 - 0,0077	168.195	15.137,55 - 2,899.91	9.323,45 - 1,786.10	5.814,10 - 1,113.81	1,62
TOTAL	NA	NA	NA	12.607.586,00 - 2,415,246.36	6.104.364,80 - 1,169,418.54	6.503.221,20 - 1,245,827.82	NA

^a Values referring to Ministry of Health ordinances No. 2898 of November 3, 2021 and No. 5 of September 28, 2017. ^b Annual consumption mean based on the quantities defined in the medication price records of the Porto Alegre municipality's electronic auctions. ^c Estimated correction factor based on the calculation that considered the annual values of medications committed, structural costs and human resources for the maintenance of all stages of pharmaceutical assistance, from the acquisition to the dispensation of medications, taken from the municipality's Management report, which is 1.4398 of the acquisition value of each item. ^d The dose per unit of atenolol supplied by the PFPB is 25 mg, while the dose of atenolol supplied by the PMPA is 50 mg. NA - Not applicable

According to the data in Table 1, the biggest difference between the purchase values of the medications is in alendronate sodium 70 mg, costing approximately ten times more for the Ministry of Health through the PFPB. On the other hand, the medications budesonide 32 mcg/dose, carbidopa 25 mg + levodopa 250 mg, benserazide hydrochloride 25 mg + levodopa 100 mg and timolol maleate 0.50% have a higher value for the PMPA compared to the PFPB but are not distributed free of charge by the program, but through co-payments. These same medications are more expensive when purchased by PMPA, according to the proportion data, which also shows the similarity in the purchase price of beclomethasone dipropionate 50 mcg between the two entities. In terms of annual expenditure, the medication that generates the most expenditure for PMPA and PFPB is simvastatin 20 mg.

In addition to the medications presented above, the PFPB provides other medications that are not included in Porto Alegre's REMUME 2020 and were not presented in Table 1: losartan potassium 50 mg; metformin hydrochloride 500 mg; metformin hydrochloride 500 mg - long-acting; ipratropium bromide 0.02 mg; salbutamol sulphate 5 mg; simvastatin 10 mg, tablet; simvastatin 40 mg, tablet; budesonide 50 mcg/dose, topical nasal administration; beclomethasone dipropionate 50 mcg/dose, topical nasal administration and timolol maleate 0.25%, ophthalmic solution.

Some medications distributed by the PMPA are supplied by specific programs of the Ministry of Health (MS). According to Ordinance 1,555 (2013), the Ministry of Health is responsible for financing, purchasing, and distributing human insulin NPH 100 IU/mL and human insulin regular 100 IU/mL to state and Federal District warehouses and pharmaceutical supply centers. It was also found that the Ministry of Health is responsible for financing and acquiring the contraceptive medications and supplies of the Women's Health Program with direct delivery to the municipalities of the capital cities, namely: norethisterone enanthate 50 mg/mL + estradiol valerate 5 mg/mL, injectable solution; norethisterone 0.35 mg, tablet; ethinyl estradiol 0.03 mg + levonorgestrel 0.15 mg, tablet; medroxyprogesterone acetate 150 mg/mL, injectable suspension.

As can be seen at the end of Table 1, the total difference between the costs of the municipality analyzed and the estimated costs of the PFPB is R\$6,503,221.20. This value represented around 1.77 times the annual cost that the municipality has with all the stages of pharmaceutical assistance, from purchasing to dispensing medications.

Discussion

When comparing the two access models, it was observed that there was greater expenditure on medications from the PFPB. In the analysis, 68.75% of medications were more expensive for the PFPB when compared to PMPA spending. The biggest difference found in the study period was related to the medication alendronate sodium 70 mg, which had a total cost 562.21% higher in the PFPB.

The PFPB was implemented with the aim of increasing the population's access to medication, which requires pharmaceutical monitoring in health services, especially in relation to the Rational Use of Medicines (Uso Racional de Medicamentos, URM). However, this service also suggests that prescribers substitute or exclude

medications if there is a risk of adverse events or incompatibility. These activities are often not carried out in private community pharmacies where the program is present, since remuneration is based on the quantity of medications dispensed, and there is no guarantee that these are being used rationally¹⁰.

According to the Ministry of Health¹¹, in the ten years since 2018, the program has served more than 32 million people and expanded access to medication, especially for chronic diseases such as asthma, diabetes and hypertension, receiving recognition from the World Health Organization (WHO) for being a successful example of expanding access to medication¹².

In this way, the chances of adherence to treatment are greater, avoiding complications in the health condition. As demonstrated by Huszcz et al. (2018), it is possible to identify a significant problem in the understanding, on the part of SUS patients, of their treatment and the correct way to administer medications. This problem can be overcome by the active work of pharmacists and the use of tools such as pharmaceutical consultations¹³. The PFPB strategy does not include targets for the implementation of clinical services by pharmacists, nor does it guarantee that all pharmacies in the program have a room for pharmacists. In the context of the PMPA, there are 14 (fourteen) pharmacists' offices and a defined line of care for diabetes, structured around pharmaceutical consultations for correct guidance on insulin application technique, storage, effective management of hypo- and hyperglycemia and use of the device to check blood glucose. In 2020, the line of care covered 9,846 registered people, who received pharmaceutical guidance¹⁴.

An important issue is to reflect on the differences in tax burdens involved in the two different procurement models, public and private, considering that taxation represents 33.87% of the final price of medications¹⁵. A recent report on the Evaluation of the Policy on Tax Subsidies for Medicines provides more evidence on this issue, by presenting the ratio between the mean price charged and the reference price of medications, by list, specifically for public sector purchases. It found that the price charged for the total number of medications marketed has approached the maximum ceiling for public purchases stipulated by CMED over the years, jumping from 22% in 2014 to just over 41% of the reference price in 2020¹⁶.

Simvastatin 20 mg represents the highest annual expenditure of all the medications analyzed. Despite the high cost to the PFPB and PMPA, the justification for continuing to supply this medication is the high proportion of the population that is affected by dyslipidemia, a disease that is considered chronic and non-communicable and is present in a large part of the population due to lifestyle and ageing¹⁷. This morbidity is commonly treated with medication from the statin class, in this case represented by simvastatin, whose mechanism of action is the inhibition of HMG-CoA reductase, improving patients' lipid profile and thus resulting in a reduced risk of cardiovascular problems and death¹⁸.

In 2013, for example, a study was carried out that economically compared the public pharmacy program in Minas Gerais with the PFPB. In it, the authors observed that "the direct production of services by the public sector in its own public network proved to be economically more favorable than outsourcing services to the private sector in the Brazilian Accredited Private Retail Pharmacies Program". The authors calculated that the private option would cost 55% more, considering the same population served¹⁰. These findings corroborate those of our study, which indicated an annual

saving of R\$6,503,221.20 when compared to the PFPB, which provides medication through private pharmacies.

In the study by Silva *et al.* (2016), which analyzed the costs of 25 common medications between public provision by the Municipal Health Secretariat (Secretaria Municipal de Saúde, SMS) of Rio de Janeiro and the PFPB, alendronate sodium and 19 other medications generate lower costs when purchased by the municipal public system than by the PFPB, corroborating the findings for the municipality of Porto Alegre. Considering the consumption of medications in 2012, the savings for the SMS of the municipality of Rio de Janeiro would be more than R\$95 million for the same products¹⁹.

A retrospective study analyzing data from the 2013 and 2019 editions of the National Health Survey (Pesquisa Nacional de Saúde, PNS) conducted in Brazil found an increase in direct disbursement for the purchase of medication in Brazil and a reduction in access to medication by the SUS among users of the system²⁰.

The study's limitations include the size and structure of the city of Porto Alegre, which may not be replicable in other Brazilian cities with fewer available resources. In addition, the analysis took place in just one year (2022) and may not be replicated in analyses covering longer time intervals.

Conclusion

The analysis suggested that, in one year, the municipality of Porto Alegre would spend more on purchasing the medications distributed by the PFPB when compared to the medications purchased through the PMPA, resulting in a difference of R\$ 6,503,221.20, about 1.77 times the annual cost that the PMPA has with all the processes of the pharmaceutical assistance stages, from purchasing to dispensing the medications.

In view of this, it is important that more studies are carried out so that it is possible to evaluate improvements to the PFPB, its integration with primary health care and, considering the difference in terms of cost when compared to the dispensing pharmacies of Porto Alegre City Hall, government measures that could review the tax burden on medications, especially those belonging to the PFPB and those of the basic component of pharmaceutical care, and the evaluation of the health costs involved in the two strategies for access to medications.

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Collaborators

LAA and DG: Project design, data analysis and interpretation. NMB: Data collection and article writing. GPP: Relevant critical review of the intellectual content.

Conflict of interest declaration

The authors declare no conflicts of interest in relation to this article.

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