REVISTA HYGEIA **ISSN: 1980-1726**
https://seer.ufu.br/index.php/hygeia DOI: https://doi.org/10.14393/Hygeia2068620

SOCIAL COSTS AND THE ECONOMIC IMPACT OF ASTHMA DURING COVID-19 IN PATIENTS ATTENDED AT A COMMUNITY PHARMACY IN SOUTHERN BRAZIL

CUSTOS SOCIAIS E O IMPACTO ECONÔMICO DA ASMA DURANTE A COVID-19 EM PACIENTES ATENDIDOS EM UMA FARMÁCIA COMUNITÁRIA DO SUL DO BRASIL

Sheyla Velasques Paladini
Federal University of Rio Grande do Sul, Graduate Program in Pharmaceutical Services, Porto Alegre, Rio Grande do Sul, Brazil
sheylavp@gmail.com

Maria Gabriela Borges Hermes
Federal University of Rio Grande do Sul, Pharmacy department, Porto Alegre, Rio Grande do Sul, Brazil
gabrielamgbh30@gmail.com

Stella Pegoraro Alves-Zarpelon
Federal University of Rio Grande do Sul, Graduate Program in Pharmaceutical Services, Porto Alegre, Rio Grande do Sul, Brazil
stellape@gmail.com

Marcia de Azevedo Frank
Hospital de Clínicas de Porto Alegre, Clinical Pharmacy, Porto Alegre, Rio Grande do Sul, Brazil
mafrank@hcpa.edu.br

Michael Ruberson Ribeiro da Silva
Federal University of Espírito Santo, Graduate Program in Pharmaceutical Services, Alegre, Espírito Santo, Brazil
michael.r.silva@ufes.br

Denise Bueno
Federal University of Rio Grande do Sul, Graduate Program in Pharmaceutical Services, Porto Alegre, Rio Grande do Sul, Brazil
denise.bueno@ufrgs.br

ABSTRACT

Introduction: Asthma is a chronic disease with a high global prevalence, resulting in substantial economic and social impacts for patients and their families. These impacts include spending on health services, medicines and lost productivity. Objective: to describe the profile of household expenses, including direct and indirect expenses and loss of income of individuals with asthma and their families in a limited population. Methods: a cross-sectional study was carried out with the application of the Family Costs of Asthma Questionnaire in a public community pharmacy in southern Brazil. Expenses were described by mean and standard deviation, presented in reais (BRL) and dollars by purchasing power parity ($). Results: A total of 57 individuals with asthma were interviewed, of which 43 (75.4%) reported having private expenses related to asthma treatment, with an average expenditure of $287.74 (R$495.19), which corresponded to 38% of current minimum wage. Furthermore, it was found that 5 people (8.7%) lost their income, referring to 2021. Loss of income occurred due to employment loss, while expenses were related to the purchase of medicines, examinations, consultations, transportation, and food, among others. Conclusion: The most of interviewees had private asthma expenses, which had a direct impact on their income. In addition to private spending, Covid-19 resulted in income loss. As a result, asthma had a significant impact on family costs during a period the Covid-19 pandemic.

Keywords: Asthma. Primary health care. Health expenditures. Pharmacy service.

RESUMO

Introdução: A asma é uma doença crônica com alta prevalência global, resultando em impactos econômicos e sociais substanciais para os pacientes e suas famílias. Esses impactos incluem gastos com serviços de saúde, medicamentos e perda de produtividade. Objetivo: descrever o perfil das despesas domiciliares, incluindo despesas diretas, indiretas

Recebido em: 09/03/2023
Aceito para publicação em: 19/02/2024.

e perda de renda de indivíduos com asma e de suas famílias de uma população circunscrita. Métodos: foi realizado um estudo transversal com aplicação do questionário de custos familiares com asma em indivíduos atendidos em uma farmácia comunitária pública no Sul do Brasil, referente ao de 2021. As despesas foram descritas por média e desvio padrão, apresentadas em reais (BRL) e dólares por paridade de poder de compra ($). Resultados: foram entrevistados 57 indivíduos com asma, dos quais 43 (75,4%) relataram ter gastos privados relacionados ao tratamento da asma, com gasto médio de $ 287,74 (R$495,19), o que correspondeu a 38% do salário mínimo em vigência. Além disso, foi identificado que 5 pessoas (8,7%) sofreram perdas em sua renda durante o ano de 2021. Foram identificadas perda de renda e despesas relacionadas à compra de medicamentos, incluindo medicamentos disponíveis pelo Sistema Único de Saúde, exames, consultas, transporte, alimentação, perda de emprego, entre outras. Conclusão: A maioria dos entrevistados tiveram gastos privados relacionados à asma, o que impacta diretamente na renda. Além dos gastos privados, houve também perda de renda em decorrência da Covid-19. Assim, verificou-se um importante impacto da asma nos custos familiares durante um período da pandemia por Covid-19.

Palavras-chave: Asma. Atenção Primária à Saúde. Gastos em saúde. Assistência farmacêutica.

INTRODUCTION

According to the World Health Organization (WHO), it is estimated that, in 2019, asthma affected approximately 262 million people and caused 455,000 deaths, with over 339 million people suffering from asthma worldwide (WHO, 2022). The impact of the COVID-19 pandemic may have aggravated these data, as respiratory diseases are one of the risk factors for severe outcomes in COVID-19. In asthma, the coronavirus worsens the severity of exacerbations by antiviral innate immune response activity (JOHNSTON, 2020).

In Latin America, Brazil is the country with one of the highest prevalence rates of asthma, presenting significant differences in its demographic regions. The North, Northeast, and Southeast regions had the highest rates of hospitalization and mortality. It is estimated that the incidence of asthma is approximately 10% among the Brazilian population (RAMOS *et al.*, 2021).

Asthma causes direct and indirect economic and social impacts, both on individuals and their family groups. This impact is due to visits to health services, purchases of medicines and other products, and issues related to loss of productivity, such as absenteeism from school or work or loss of one's employment (CZIRA *et al.,* 2022; OLIVEIRA, 2018).

The impact of hospitalizations for respiratory causes on work performance in the formal market and the Brazilian municipal Gross domestic product (GDP) per capita demonstrate that health and economic crises are not independent problems and that losses in the health system reverberate with negative impacts on the economy and the arrangement of society. Recent data suggest that an increase of merely 1% in hospitalizations for respiratory diseases, overlapping with the coronavirus context, would already be enough to generate negative impacts on municipal GDP per capita and the population's formal income of 0.09% and 0.097%, respectively (CRUZ; CASTRO*,* 2020).

In Brazil, access to drug treatment is a key part of the constitutional right to health. The National Pharmaceutical Services Policy (PNAF), approved in 2004, was established to guarantee access to safe, effective, high-quality treatments and to promote the rational use of medicines made available to the population. Pharmaceutical Services (PS) is part of the National Medicines Policy of the Ministry of Health (MS), having been organized, through MS Ordinance No. 204, of January 29, 2007, into three components with different financing and management mechanisms – basic, strategic, and specialized – guided by the National List of Essential Medicines (RENAME) (BRASIL, 2007; PEREIRA DA SILVA *et al.*, 2023).

Asthma presents itself as a health condition that requires a complex treatment regimen, which may include polypharmacy, several daily administrations, difficulties associated with medication administration, and difficulties in adherence to treatment. In this sense, the cost of medication stands

out as a barrier to access to medication that has negative impacts on adherence to treatment, leading to low adherence to therapy (PITREZ, 2023; SILVAL *et al.*, 2022).

The purpose of the study was to describe the profile of household expenses, including direct and indirect expenses and the loss of income of subjects with Asthma and of their families, through the Family Costs of Asthma Questionnaire, which occurred in 2021, the second year of the COVID-19 pandemic in Brazil, in a public pharmacy in southern Brazil.

METHODS

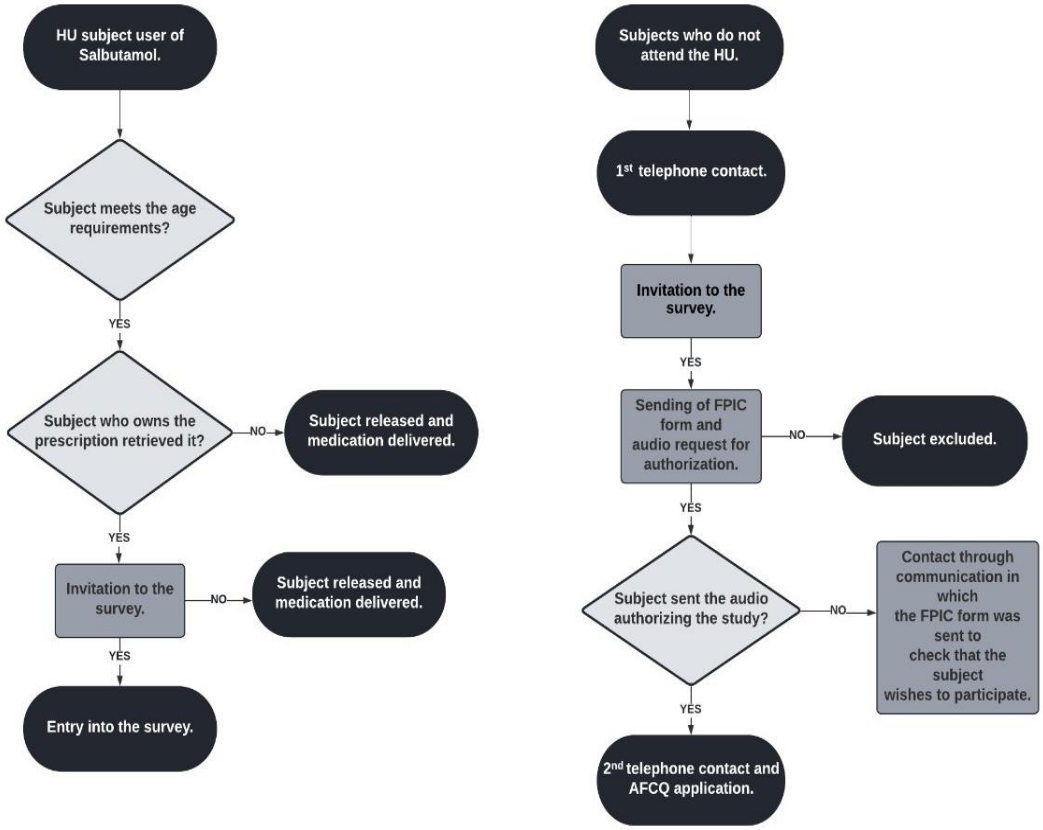
Study type and population

A descriptive cross-sectional epidemiological study was carried out. Users aged 18 years or over and diagnosed with asthma were interviewed, comprising a convenience sample of consecutive subjects treated at a Health Unit (HU) Pharmacy of a university hospital in the South region of Brazil, from March to April 2022.

The HU follows a teaching and assistance-based approach, with undergraduate courses in medicine, nursing, nutrition, pharmacy, speech therapy, physical therapy, and psychology. It is responsible for a population of approximately 43,000 people, with 20.7% of the population being over 60 years old. Four Family Health Teams provide care to the population, with the support of 10 community health agents, two nutritionists, one pharmacist, and one social worker, as well as professors responsible for graduation and the Medical Residency and Multi-Professional Residency Programs (MENDONÇA *et al.*, 2020).

Salbutamol was chosen for screening subjects, as it is the most commonly dispensed asthma medication at this basic HU. During the study period, at the time of dispensing this medication, an approach was carried out with an invitation to participate in the research, followed by the signing of the Free, Prior and Informed Consent Term (FPIC) and the application of the interview individually, in a place reserved, without interference from third parties (Figure 1).

Figure 1 – AFCQ application flowchart in person and via telephone contact



Legend: Family Cost of Asthma Questionnaire (AFCQ); Free, Prior, and Informed Consent (FPIC); Basic Health Unit (HU)

Subjects who were registered in the HU Pharmacy system list with a record of monthly Salbutamol retrievals and who had not attended the HU during the research period or who had the medication retrieved by a caregiver were contacted by telephone and invited to respond to the interview remotely. Contacts with the HU Pharmacy users were made at two different times: in the first contact, the invitation was made to participate in the study, and the Free, Prior, and Informed Consent Term (FPIC) was sent through a message application. After acceptance, the second telephone contact was carried out via audio messaging, in which the AFCQ was applied (Figure 1).

In the interviews, the Family Costs of Asthma Questionnaire (AFCQ) was applied by six trained interviewers, under the supervision of the unit's pharmacist.

The AFCQ was created from a questionnaire created to quantify the family costs of tuberculosis (COSTA *et al.*, 2005). The AFCQ was adapted and validated for use in the Bahia Asthma Control Program (ProAR), providing information relating to direct and indirect spending and assessment of the loss of income, enabling the planning of interventions (FRANCO *et al.*, 2008).

The questionnaire consisted of 44 questions divided into user identification (date of birth, gender, education, and occupation) collected from the HU electronic medical record and into six blocks of questions: (A) losses from work not performed due to asthma; (B) transportation spending and waiting time regard to asthma; (C) losses from work not performed by other family members due to asthma; (D) family earnings; (E) extra spending in the private sector and medicines; and (F) other extra household expenses due to asthma.

Adaptations were made to the original instrument by Franco (2008) considering the context of the study. Participants were asked to answer the questions considering the twelve months of 2021.

The collected data were transferred to the Microsoft Office Excel. To assess the ability of the questionnaire to discriminate the economic impact on the daily lives of patients with asthma, test validity measures were employed. Data analysis was performed by frequency distribution. Expenses were described by mean and standard deviation. Monetary values were presented in Brazilian reais (BRL) and Dollars by Purchasing Power Parity (PPP), using the 2021World Bank's conversion factor of 2.53. Statistical analyses were performed using the Jamovi software program, version 2.2.5.

The study received approval from the Research Ethics Committee of the Hospital de Clínicas de Porto Alegre - HCPA, under Opinion 2021-0565 and registration CAAE 54683321.3.0000.5327.

RESULTS

Of the 140 subjects who took salbutamol at the basic health unit during the study period, 83 were excluded from the sample because they did not accept or were not able to participate in the survey. Among the reasons for exclusion analyzed, we observed the presence of people under 18 years of age, which was an inclusion criterion for the study, family members and caregivers who retrieved the medication on behalf of the patient, and patients who used the medication for another diagnosis, different from asthma.

General characteristics

Fifty-seven subjects were included in the study, of which 49 participated in person and 8 participated by telephone. The study included 40 females (70.2%) and 16 males (28.1%), and one of the interviewees did not declare a gender. The age group ranged from 18 to 82 years, the most prevalent being between 61 and 70 years, totaling 18 (31.6%) of the subjects, followed by the age group of 51 to 60 years with 12 (21.0%) subjects. Regarding the level of education, 29 respondents had completed secondary education (50.9%).

Profile of expenses and loss of income

Of the 57 respondents, 43 (75.4%) reported having private health expenses, with an average expenditure of $287.74 (495.19 BRL). Of the 43, five (11.6%) reported a loss of employment or missed workdays due to asthma, with a median income drop of $909.09 (385.25 BRL). Additionally, 31 (72.1%) people spent an average of $9.62 (SD 22.78) on transportation; 6 (14.0%) reported other expenses related to travel to health services, including food and parking, at an average of $17.52 (SD 19.95); 17 (40%) people spent an average of $52.29 (SD 45.26) on medication; 7 (16.3%) people spent an average of $242.80 (SD 266.30) on consultations and exams; 11 (25.6%) spent an average of $176.07 (SD

266.30) on healthcare plans, and 10 (23.3%) people reported that they spent an average of $268.02 (SD 602.57) on other extra asthma-related expenses (Table 1).

Table 1 – Profile of Expenditure and Loss of Income due to Asthma symptoms in the last year, Porto Alegre, 2021

	Loss of employment	Transport	Food/ parking	Medication	Consultation / Exam	Health care plan	Extras	Total
# of interviewees	5	31	6	17	7	11	10	43
Average $	909.09	39.62	17.52	52.29	242.80	176.07	268.02	287.74
Standard deviation	385.25	22.78	19.95	45.26	266.30	122.88	602.57	495.19
Average BRL	2300	100.23	44.33	132.29	614.29	445.45	678.10	727.97
Standard deviation	974.68	57.61	50.47	114.52	673.74	310.88	1524.52	1252.82

The conversion factor for the Dollar PPP = 2.53.
Source: author's own, based on data collected from the participants.

Visits to health services

Among the interviewees, 41 (71.9%) subjects made 11 to 15 visits in the last year to health services due to asthma, with the following reasons: 24 (42.1%) subjects exclusively intended to retrieve the medication; 14 (24.6%) for consultations and medication retrieval; 11 (19.3%) for examination, consultations and medication retrieval; 4 (7.0%) for medication retrieval and emergency, 1 (1.8%) for examination, consultation, medication retrieval, and hospitalization, 1 (1.8%) for examination, medication retrieval, and emergency, 1 (1.8%) for examination and medication retrieval, and 1 (1.8%) did not inform the reason for their visit.

Of those interviewed, 19 (33.3%) needed to be accompanied when visiting health services. Six (31.6%) of the companions did not stop working and, subsequently, had no loss of income; 8 (42.1%) stopped working to accompany the subject with asthma, but were not negatively affected, i.e., they did not stop receiving income due to the monitoring; and 5 (26.3%) stopped working and received no income due to accompanying the subjects (Table 2).

Of the 5 companions who stopped working and had financial losses, the loss in their income ranged from 50.00 BRL to 750.00 BRL. Only 1 did not live with the interviewee and did not receive 50.00 BRL, while 4 (80%) companions who stopped working and receiving income due to the monitoring lived with the interviewee (Table 2).

Table 2 – Relation of loss of income by the family nucleus of companions

Components of the companion's family group with loss of income	Gross household income (minimum wage)	Loss of household income
7 people	0.5-1	BRL 100.00 ($39.53)
2 people	0.5-1	BRL 350.00 ($138.34)

2 people	1-2	BRL 750.00 ($296.44)
2 people	4-5	Did not inform

*Minimum wage (12/2021) = BRL 1,212 / $479.05
Source: author's own, based on data collected from the participants.

Travel to the health service

Forty-seven (82.5%) subjects used a means of transportation to travel to the health services, with the bus being the means of transportation used by 20 (35.1%) subjects. The other 10 (17.5%) subjects used more than one means of transportation or, depending on weather conditions, traveled without using any transportation to the health services. The travel time of these subjects ranged from 5 minutes to 2 hours, with 31 (54.4%) of the respondents dedicating 15 to 30 minutes of their day to the journey.

Household income

Considering the minimum wage as of December 2021, of 1,212.00 BRL ($479.05), the total monthly household income of the subjects ranged from 0.5 to 10 minimum wages. It was observed that 33 (57.9%) of the study participants had a household income of up to 3 minimum wages, with 19 patients with a household income of 1-2 minimum wages and 14 patients with a household income of 2-3 minimum wages.

The group of subjects with the lowest household income (1-2 minimum wages) had the following household constitution: 8 lived alone, 3 lived with one person, 4 lived with two people, and, finally, 4 lived with three people. Among those with a household income of 2-3 minimum wages, it was observed that 3 lived alone, 6 lived with one person, 3 lived with two people, 1 lived with three people, and 1 lived with four people.

Private sector expenses relating to consultations and exams

Ten (17.5%) subjects reported having expenses with consultations and exams in the private sector due to asthma, with 6 having higher expenses (Table 3).

Table 3 – Characteristics of subjects with loss of income due to asthma symptoms and subjects with the most significant expenses related to treatment

Occupation	Household income (minimum wage)	Household (# of people)	Loss of income (R$)	Spending in R$ ($)	Item and reason reported by the user
App driver	8-9	4	4000 ($1581.03)	240 ($94.86)	Gasoline for travel to health services for medication and emergencies.
				600 ($237.15)	Examination and consultation in the private sector.
				600 ($237.15)	Healthcare plan expenses.
Self-employed	9-10	5	2000 ($790.51)	22 ($8.70)	Gasoline for transportation and parking for consultation and retrieval of medication at the basic health unit.

				40 ($15.81)	The hiring of a caregiver.
Unemployed	2-3	2	2000 ($790.51)	450 ($177.87)	Purchase of nebulizer and inhaler and home renovation.
Unemployed	0,5-1	2	1500 ($592.89)	134 ($52.96)	Transportation to health services.
				350 ($138.34)	Companion loss of income.
Retiree	2-3	Alone	2000 ($790.51)	115 ($45.45)	Transportation to health services.
				140 ($55.34)	Purchase of medication.
Retiree	1-2	1	N/A	171 ($67.59)	Purchase of medication. It is not provided by the municipality.
				150 ($59.29)	Examination and consultation. Delay in scheduling by the public sector.
				63 ($24.90)	Travel. Transit app to go to the health services.
				171 ($67.59)	Caregiver and supplies. The hiring of a caregiver and asthma treatment supplies.
Unemployed	2-3	1	N/A	80 ($31.62)	Medication. It is not provided by the municipality.
				200 ($79.05)	Examination and consultation. It is not available in the public sector.
Retiree	7-8	3	N/A	160 ($63.24)	Medication. It is not provided by the municipality.
				350 ($138.34)	Examination and consultation. Delay in scheduling and unavailability in the public sector.
				147.2 ($58.10)	Travel. Bus to go to the health services.

Health agent	1-2	2	N/A	500 ($197.63)	Medication. Does not retrieve it in the public sector.
				400 ($158.10)	Purchase of asthma treatment supplies.
Domestic worker	1-2	2	N/A	2000 ($790.51)	Examination and consultation. Delay in scheduling by the public sector.
				57.6 ($22.77)	Travel. Bus to go to the health services.
Retiree	2-3	Alone	N/A	900 ($355.73)	Examination and consultation. It is not available in the public sector.
				900 ($355.73)	Healthcare plan expenses.
Retiree	4-5	1	N/A	500 ($197.63)	Healthcare plan expenses.
Retiree	NI	1	N/A	1010 ($399.21)	Healthcare plan expenses.
Retiree	7-8	3	N/A	350 ($138.34)	Healthcare plan expenses.

*Minimum wage (12/2021) = BRL 1,212. $479.05; Not informed (NI); Not Applicable (N/A)
Source: author's own, based on data collected from the participants.

Expenses relating to healthcare plans

Thirteen (22.8%) of the patients reported being covered by a healthcare plan in the last year. Expenses ranged from $19.76 to $399.21. The 5 subjects who had higher expenses are described in Table 3.

Private sector expenses relating to medicines

Twenty (35.1%) respondents reported that they purchased medicines with direct disbursement due to asthma. The table 4 lists medications with the reason reported by the subject.

Table 4 – Medicines purchased in the private sector, Pharmaceutical Services component, and reason for purchase reported by the user

Number of subjects who purchased	Medication	Component	The reason reported by the user
10	Formoterol + budesonide fumarate	Specialized	Medication is not provided by the municipality.
1	Prednisone	Basic and Strategic	Absence in the municipal pharmacy.
5	Salbutamol sulfate	Basic	Urgency in use; did not look for it in the municipal pharmacy; the impossibility

			of picking up the medicine at the municipal pharmacy.
2	Budesonide	Basic	Absence in the municipal pharmacy and medication not provided by the municipality.
1	Beclomethasone	Basic	Absence in the municipality pharmacy.
1	Naphazoline hydrochloride	–	Not provided by the municipality.
1	Bamiphylline hydrochloride	–	Medication is not provided by the municipality.
1	Salmeterol xinafoate + fluticasone propionate	–	Medication is not provided by the municipality.
1	Ipratropium bromide + fenoterol hydrobromide	–	Medication is not provided by the municipality.
2	Fenoterol hydrobromide	–	Medication is not provided by the municipality.

Source: author's own, based on data collected from the participants.

Other household expenses due to asthma

Sixteen (28.1%) subjects reported that they had extra expenses with asthma, 12 (75.0%) bought asthma treatment supplies, and 4 had different expenses, including the following: 1 (6.2%) had to change their domicile and purchase supplies (the value was not reported), 1 (6.2%) made renovations to their house and purchased supplies due to asthma needs, paying $177.87, 1 (6.2%) hired a caregiver and spent $15.81, and, finally, 1 (6.2%) hired a caregiver and purchase asthma treatment supplies, paying $67.59 (Table 3).

DISCUSSION

Characteristics of the study population and loss of income

Many users went to the health service exclusively for medication retrieval, while 32 (56.1%) were for multiple reasons, such as medication retrieval associated with one or more of the reasons, including consultation, examination, hospitalization, and emergency. One of the users with the highest expenditure stands out, having reported that he needed to go to the health services in the last year for an examination, consultation, medication retrieval, and hospitalization purposes. This subject is self-employed and lives with 1 person, who together have a household income of 4-5 minimum wages. He spent $49.01 on Salbutamol and Naphazoline Hydrochloride due to an urgent need to use the medication and was unable to travel to collect the medication at the municipal pharmacy. Furthermore, he had to purchase a nebulizer for $1,976.28 due to asthma symptoms.

We observed a drop in the salary income of subjects and their companions to travel to health services, thus characterizing a loss in household income. The expenses were related to hiring a caregiver and transportation such as bus fares, gasoline, parking, and other forms of displacement.

Among the 57 interviewees, 33 subjects had a household income of 1-3 minimum wages and the household composition varied from one to four subjects. Considering data from the 2010 Census, the city of Porto Alegre has 234,699 households consisting of one person and 15,135 households consisting of more than three residents (IBGE, 2010).

According to the National Household Sample Survey (PNAD), the average monthly real household income per capita in the country as of 2021 was $534.78, being $654.54 in the South region. This average monthly household income per person fell by 6.9% compared to 2020 and comprises the lowest values since the beginning of this research, in 2012. The decrease reflects the drop in the average

income from work – the percentage of people with income of any kind in Brazil reduced from 61% to 59.8% – as well as the decrease in income from other sources, which went from 28.3% to 24.8% (IBGE, 2022a).

Another key aspect of the income of Brazilians during the pandemic period was the presence of social programs. In 2020, the first year of the pandemic, there was an increase in income from "Other Social Programs," which include emergency aid. Nevertheless, in 2021, there were changes in the concession criteria and in the aid amounts, which explains the reduction in this income category, which fell from 23.7% to 15.4%. As regards other social programs, there was a reduction in the proportion of households that had a recipient between 2020 and 2021 (IBGE, 2022b). The drop in monthly household income per capita was more pronounced in the lower-income population (IBGE, 2022a; IBGE, 2022b).

Following the country's trend in 2021, the average monthly income in the state of *Rio Grande do Sul* fell by 3.4%, considering the year 2020, considering all sources of income of all social classes, reaching the lowest values since the beginning of this research in 2012 (SALATA; RIBEIRO, 2022).

Expenses due to asthma symptoms

In the course of this research, 17.5% of subjects reported that they paid for consultations and examinations in the private sector due to asthma, with expenditures ranging from $59.29 to $790.51. Among the reasons reported, the delay in scheduling and lack of availability of the exam in the public sector were the main causes that burdened families. The most significant expense was for a subject with an income of 1 to 2 minimum wages, a domestic worker, who lived with two people, as there was a delay in scheduling by the public sector and urgency in the need.

The subject who had the greatest loss of income in the last year due to asthma symptoms recorded a loss of $1581.03, a transit app driver, with an income of 8 to 9 minimum wages, lived with 4 people and needed to spend $237.15 on conducting examinations and consultations. Additionally, this subject had to pay $94.86 in fuel to travel to the health services for medication and emergency care to handle a crisis, as well as $237.15 for health insurance.

Regarding healthcare plan expenses, it was observed that they vary, according to the subjects' reports, without a description of the price paid monthly for the healthcare plan and any co-payments where applicable. Five subjects had more significant expenditures (Table 3), with expenditures ranging from $138.34 to $399.21. The largest expense was for a retired subject who did not report his household income and lived with one person.

Extra household expenses due to asthma were mostly related to purchases of asthma supplies, which included nebulizers, inhalers, and humidifiers. Other reports included the need to change one's domicile and perform renovations that, despite not being reported, had amounts that impacted household income.

The need to purchase 10 medicines in the private sector was reported, of which 5 are provided through the public policies of Pharmaceutical Services, of which 4 are available through the basic component and 1 in the specialized component, this being the drug Formoterol fumarate associated with budesonide, a long-acting bronchodilator, which was purchased by 10 (50.0%) subjects who purchased medication (Table 4). The reason reported for the purchase was that it was not available at the municipal public pharmacy.

In the National Survey on Access, Use, and Promotion of the Rational Use of Medicines, conducted in Brazil in 2014, the most widely used medication for people with m chronic respiratory diseases was formoterol fumarate associated with budesonide (BRASIL, 2016).

Salbutamol is a fast-acting bronchodilator, having been the second most purchased drug by subjects (Table 4) and is available through the basic component, being used in rescue therapy for rapid improvements in the measures of expiratory flow, which occurred minutes after the use (BRASIL, 2021). In this case, the need for urgent purchase is justified.

There are difficulties in accessing the medicine of the specialized component that is attributed to a lack of an information and communication system. This lack of knowledge causes barriers to access to medication, household income, and worsening of the health condition of unassisted subjects. It is observed that non-adherence to treatment leads to the search for service at other levels of care, burdening the health system. The right to access information should be taught as a basic instrument to

provide transformation, as when subjects are aware of their rights, they may be able to claim them and exercise their citizenship with autonomy (BRITO; ARAUJO, 2022).

In order to offer effective and safe healthcare, it is crucial that forms of communication be strengthened, allowing health professionals to transmit and receive information in a clear and correct way. In the study by Guerin et al. (2012), a quarter of the interviewees reported that, at the HU, they did not inform about the place for acquiring prescription drugs that were not available in primary care, but rather provided by other components of PS.

When there are obstacles in the acquisition of medicines, demand for health is generated, with consequences for health promotion. The cost of the medication when not publicly available, possible lack of communication between the healthcare team and the subject, and displacement from one's home territory to meet their health demands comprise barriers that make it difficult to ensure compliance with the IT (GUERIN *et al.*, 2012).

Of the medicines purchased in the private sector, five are not provided by the municipality or at any level of the PS components. In the study by Tavares et al. (TAVARES *et al.*, 2016), subjects who had to pay for part of their treatment, when compared to those who had free access to all the medicines needed to treat chronic diseases, had a higher prevalence of low adherence. Due to the impossibility of continuously paying for their treatment, 80.0% of these subjects showed changes in adherence to the appropriate therapeutic conduct prescribed by the health team.

The high prevalence of asthma among the population, coupled with the fact that treatment involves direct and indirect costs, demands a high volume of financial resources to manage this condition. Hospitalization and medication expenses are responsible for most of the direct costs, while loss of employment and school absenteeism has the highest impact on indirect costs (CANÇADO *et al.,* 2018). The Global Strategy for Asthma Management and Prevention 2022 report describes that the cost of medicines comprises the main expense in asthma treatment (GINA, 2022).

Despite Brazilian policies to expand access to medicines through pharmaceutical services, there are challenges in the financing, the management of the health system, and the breakdown of services. In the country, the number of people who did not obtain medication through the public system increased, and the direct disbursement for the purchase of medication increased, also increasing health inequalities and impacting the budget of families, mainly those with lower income (BOING *et al.*, 2022). In this regard, a relevant number of patients attended by HU Pharmacy had private expenses during Covid-19 pandemic, which impacted negatively in theirfamily budget.

The limitations of this research are mainly due to the sample size, retrospective data collection, and the memory bias of the subjects, who may be underestimating or overestimating the expenses incurred in the last year with the asthma symptoms related to the last year. The presence of an interviewer may have influenced the responses, but training was carried out to minimize possible interference.

CONCLUSION

In this research, subjects who have suffered substantial losses in their income were required to bear one extra expense related to the treatment of asthma in the past year. These research subjects had a household composition and variable household income, many of them being in households with two or more subjects and a household income represented by one to three minimum wages. This research identified a significant purchase of medicines provided by some of the pharmaceutical services components among the subjects interviewed, which demonstrates that the lack of knowledge regarding a service has impacted the population's income and the appropriate adherence to effective treatments. The fragmentation of healthcare harms subjects in their search for treatment adherence. Health professionals must be aware of the therapeutic itinerary taken by subjects with asthma in the search for their medication so that they can contribute to minimizing barriers to access to drug treatment.

REFERENCES

BOING *et al.* Acesso aos medicamentos por usuários do sus. **Cad. Saúde Pública**, v. 8, n. 6, p. e00114721, 2022. https://doi.org/10.1590/0102-311xpt114721

BRASIL. Ministério da Saúde. **PORTARIA CONJUNTA Nº 14, DE 24 DE AGOSTO DE 2021**. [Retrieved: Jan 28, 2022]. https://www.gov.br/saude/pt-br/assuntos/pcdt/arquivos/2021/portal-portaria-conjunta-no-14_pcdt_asma_.pdf.

BRASIL. Ministério da Saúde. **PORTARIA Nº 204, DE 29 DE JANEIRO DE 2007.** Disponível em:

https://bvsms.saude.gov.br/bvs/saudelegis/gm/2007/prt0204_29_01_2007_comp.html. Acesso em: 20 Jul. 2022.

BRASIL. Ministério da Saúde. Secretaria de Ciência, Tecnologia e Insumos Estratégicos. **Série Pnaum – Pesquisa Nacional sobre Acesso, Utilização e Promoção do Uso Racional de Medicamentos no Brasil.** Disponível em:

https://bvsms.saude.gov.br/bvs/publicacoes/componente_populacional_resultados_pnaum_caderno3.pdf. Acesso em: 20 sep. 2022.

BRITO A.H, ARAUJO M.O. Percepção dos usuários sobre o acesso a medicamentos do Componente Especializado da Assistência Farmacêutica. **HU Revista**, v. 48, p. 1-9, 2022. https://doi.org/10.34019/1982-8047.2022.v48.36718

CANÇADO J.E.D, PENHA M, GUPTA S, LI V.W, JULIAN G.S, MOREIRA E.S. Respira project: Humanistic and economic burden of asthma in Brazil. **Journal of Asthma**, v. 56, n. 3, p. 244-251, 2018. https://doi.org/10.1080/02770903.2018.1445267

CZIRA, A. *et al*. A systematic literature review of burden of illness in adults with uncontrolled moderate/severe asthma. **Respiratory Medicine**, v. 191, p. 106670, 2022. https://doi.org/10.1016/j.rmed.2021.106670

COSTA J.G, SANTOS A.C, RODRIGUES L.C, BARRETO M.L, ROBERTS J.A. Tuberculose em Salvador: Custos para o sistema de saúde e para as famílias. **Revista de Saúde Pública**, v. 39 n. 1, p. 122-128, 2005. https://doi.org/10.1590/S0034-89102005000100016

CRUZ B.F, CASTRO M.A**. Impactos econômicos das internações por causas respiratórias: uma análise para os municípios brasileiros**. Associação Nacional dos Centros de Pós-Graduação em Economia ANPEC, **XXIII Encontro de economia da região sul**, Disponível em: https://www.anpec.org.br/sul/2020/submissao/files_I/i8471dbe3db58a986998e881cf9040da14.pdf. Acesso em: 4 oct. 2021.

FRANCO R, NASCIMENTO H.F, SANTOS A.C, MACHADO C.S, PONTE E, MACHADO A.S, LOUREIRO S, BARRETO M.L, RODRIGUES L.C, CRUZ A.A. Análise de Custo Efetividade do ProAR - um programa modelo para controle da asma grave. **Gazeta Médica da Bahia**, v. 78, n. 1, p. 3-10, 2008. Disponível em: http://www.gmbahia.ufba.br/index.php/gmbahia/article/viewFile/233/224. Acesso em: 23 jan. 2022.

GINA. **Global Strategy for Asthma Management and Prevention**: GINA, 2022. Disponível em: https://ginasthma.org/gina-reports/. Acesso em: Jan 23, 2022.

GUERIN G.D, ROSSONI E, BUENO D. Itinerários terapêuticos de usuários de medicamentos de uma unidade de Estratégia de Saúde da Família. **Ciência & Saúde Coletiva,** v.17, n. 11, 2012. https://doi.org/10.1590/S1413-81232012001100017

IBGE. Instituto Brasileiro de Geografia e Estatística. **Censo [Online] 2010.** Disponível em: https://cidades.ibge.gov.br/brasil/rs/porto-alegre/pesquisa/23/47427. Acesso em: 02 apr. 2022.

IBGE. Instituto Brasileiro de Geografia e Estatística. **Em 2021, rendimento domiciliar per capita cai ao menor nível desde 2012.** Brasil, 2022a. Disponível em: https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/34052-em-2021-rendimento-domiciliar-per-capita-cai-ao-menor-nivel-desde-2012. Acesso em: 06 aug. 2022.

IBGE. Instituto Brasileiro de Geografia e Estatística. **Pesquisa Nacional por Amostra de Domicílios Contínua. Rendimento de todas as fontes 2021.** Brasil, 2022b. Disponível em: https://biblioteca.ibge.gov.br/visualizacao/livros/liv101950_informativo.pdf. Acesso em: 03 out. 2022.

JOHNSTON, S. L. Asthma and COVID-19: Is asthma a risk factor for severe outcomes? **Allergy**, v. 75, n. 7, p. 1543-1545, 2020. https://doi.org/10.1111/all.14348

MENDONÇA C.S, ROSSET I, GONÇALVES M.R, MEDEIROS A.F, DIAS A.V, NASCIMENTO F.R, MASIERO F.S, PELEGRINI G, RAGNINI J.M, LEITE L.O, ET Al. Resposta assistencial de um serviço

docente assistencial de APS à pandemia da COVID-19. **APS em revista**, v.2, n. 1, p. 33-37, 2020. https://doi.org/10.14295/aps.v2i1.63

OLIVEIRA M.A. Epidemiologia da asma: é necessário ampliar nossos conceitos. **Jornal Brasileiro de Pneumologia**, 2018; 44(05). https://doi.org/10.1590/s1806-37562018000050004

PEREIRA DA SILVA, M. T.; APARECIDO DE CARVALHO, G.; MARINI, D. C. Análises das Demandas Judiciais para aquisição de Medicamentos. **Brazilian Journal of Implantology and Health Sciences** , v. 5, n. 2, p. 191–211, 2023. https://doi.org/10.36557/2674-8169.2023v5n2p191-211

PITREZ, P.M. The challenges of asthma care in low- and middle-income countries: what's next? **Jornal Brasileiro de Pneumologia**, v. 49, n. 3, 2023. https://doi.org/10.36416/1806-3756/e20230215

RAMOS B.G, Martins T.B.D, Castro M.E.P.C. Prevalência da asma nas regiões do Brasil: uma revisão sistemática. **Brazilian Journal of Health Review**, v. 4, n. 3, 2021. https://doi.org/10.34119/bjhrv4n3-133

SALATA A.R, RIBEIRO M.G. Porto Alegre (RS): **Boletim Desigualdade nas Metrópoles**, n. 07, 2022. Disponível em: https://www.observatoriodasmetropoles.net.br/wp-content/uploads/2022/10/BOLETIM_DESIGUALDADE-NAS-METROPOLES_10.pdf . Acesso em: 07 out. 2022.

SILVAL. G.; REISE, D. DOS; MARCENIO, J. DOS S.; ARAÚJO NETO, J.F. DE. Assistência farmacêutica para pacientes com asma: revisão integrativa. **Revista Artigos. Com**, v. 34, p. e9451, 2022.

TAVARES, N.U.L; BERTOLDI, A.D.; MENGUE, S.S.; ARRAIS, P.S.D.; LUIZA, V.L.; OLIVEIRA, M.A.; RAMOS, L.R.; FARIAS, M.R.; PIZZOL, T.S.D. Fatores associados à baixa adesão ao tratamento farmacológico de doenças crônicas no Brasil. **Revista de Saude Pública**, v. 50, n. 2, 2016. https://doi.org/10.1590/s1518-8787.2016050006150

WHO. World Health Organization. **Asthma [Online] 2022.** Donível em: https://www.who.int/news-room/fact-sheets/detail/asthma . Acesso em: 07 out. 2022.