

Dimensions of Access to Antihypertensive Medications in Ceilândia, Distrito Federal, Brazil

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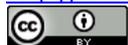
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Abstract

Access can be understood as the sum of a number of elements of the interface between patients and the health care system. This study took a comprehensive approach to the dimensions of access to medications, employing indicators to evaluate the dimensions of access to antihypertensive medications in Ceilândia, DF, Brazil. This was a cross-sectional epidemiological study, administering questionnaires during home visits. The survey covered epidemiological and socioeconomic profiles, behavioral habits and the dimensions of access to antihypertensive medications comprising physical, financial, and geographic availability and accept ability according to the hypertensive population of Ceilândia. The total sample comprised 400 individuals and the hypertensive subset numbered 140 (35%). Indicators of physical availability of medications revealed that users found it difficult to acquire their drugs on almost one third of occasions and in some cases were unable to access any of these products. The greatest barriers to access were reported by users of pharmacies belonging to the Brazilian National Health Service (SUS) and on the “People’s Pharmacies” network. More than one third of the hypertensive sample spent their own money on medications they could not find at these pharmacies. The majority of the hypertensive subsets were overweight/obese, a minority engaged in physical activity and 40% were smokers/ex-smokers. More women reduced their salt intake. Men had higher incomes, educational level, and socioeconomic status. Failure to keep the public health care system supplied has prejudiced access to essential medications for hypertension treatment, transferring the costs onto users. This population has lifestyle habits that increase the risk of exacerbation of hypertension. These results reveal a

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need for effective public policies to ensure access to antihypertensive medications and involve users of the health care system in changing their habits and behaviors in order to achieve adequate and lasting control of systemic arterial hypertension.

Keywords

Health Care Access, Systemic Arterial Hypertension, Drug Treatments

1. Introduction

Systemic arterial hypertension (SAH) is a multifactorial clinical condition characterized by consistently high blood pressure that is often associated with increased risk of fatal and non-fatal cardiovascular events [1]. The prevalence of hypertension is high, while the proportion of cases that are controlled is low, and it is considered one of the most important modifiable risk factors. Population-based studies conducted in Brazilian cities over the last 20 years have detected SAH prevalence rates exceeding 30% [2] [3].

Treatment with drugs is prescribed with the objective of protecting target organs, reducing the impact of elevated blood pressure and its associated risk factors and combatting progression of the atherosclerotic process [4]. Lack of the medications used to treat SAH has countless consequences, both individual and collective, since the social and economic costs of the possible sequelae and mortality that result when there are barriers impeding access to these products must be borne by the people affected and by society.

There is evidence that the control of arterial hypertension achieved in the United States of America over recent decades is a result of increased availability of drug-based treatment [5]. Access to medications can be understood as “[the relationship between the need for medications and their availability, by which this need is met at the time and place of patient need, while ensuring quality and sufficient information for correct use]” [6], or, alternatively, as the user’s ability to obtain the medication prescribed them, with or without direct payment [7]. These conceptualizations imply recognition that access is only achieved when the medication is used.

Notwithstanding, access is not limited to the availability of a product or resource, but is part of a complex network and encompasses several different interrelated aspects and constructs. Access to health care includes the provision of medications to guarantee the right to health and, as a consequence, to the basic right to life, requiring proactive actions from the State, actions through which the State guarantees to its citizens provision of the medications indispensable for their treatment [8]. Access to medications can be understood as the sum of a number of more specific elements of the interface between the patient and the health care system. Literature on the subject deals with a number of specific dimensions, expanding the concept of access to medications and to health services [9].

The first of these is related to the physical availability of the product and is defined as the relationship between the type and quantity of the product or service that is needed and the type and quantity of the product that is provided. The second dimension is the ability to acquire care, related to the magnitude of the prices of products and the costs of services and to people’s ability to pay. A third dimension is geographic accessibility, which covers the relationship between the location of products and services and the locations of the users of these products and services, taking into account user’s resources and the distances to be travelled and the time taken to do so. The last of these is the dimension of acceptability or satisfaction and is the relationship between users’ attitudes and expectations with respect to products and services and the actual characteristics of those products and services [9].

This study was conducted in the city of Ceilândia, which is in Brazil’s Distrito Federal (DF), against a background of growing recognition of the importance of the production of information through scientific research to provide a foundation for strategic planning of public policies for promotion of the health, and improvement of the quality of life, of the population of Ceilândia. The town has the largest population in the DF and is home to one of the campuses of the University of Brasília.

To date there are no epidemiological studies describing the current scenario of the population of Ceilândia’s access to drug-based treatment for SAH, which is prejudicial to redirecting and formulating policies and to planning of health care strategies.

From this perspective, it is important to assess access to antihypertensive medications, in order to contribute to public policies for pharmaceutical care and to improving the quality of health services. The objective of this study is to describe the profile of the hypertensive population of Ceilândia and to assess the dimensions of this population's access to medications for treatment of Systemic Arterial Hypertension.

2. Methods

This is an epidemiological study with a cross-sectional design investigating access to medications for treatment of SAH with surveys conducted during home visits.

The study target population comprised people aged 18 years or older living in households chosen by lots in the city of Ceilândia, DF, Brazil. Ceilândia contains the neighborhoods Ceilândia Centro, Ceilândia Sul, Ceilândia Norte, P Sul, P Norte, Setor O, Expansão do Setor O, QNQ, QNR, Pôr do Sol and Sol Nascente, plus an industrial zone and a construction materials zone and part of an INCRA (National Institute for Colonization and Agrarian Reform) land reform area. The sample size was estimated on the basis of the size of the population of Ceilândia reported by the 2013 District Survey of Households by Sample [10] (449,592 inhabitants).

The sample size estimated was 400 people, calculated to provide a 95% confidence interval based on statistical parameters. Residents from the industrial zone, the construction materials zone and the INCRA area were excluded from the sample, because they are designated as rural areas, as were residents of Pôr do Sol and Sol Nascente, because these neighborhoods are not yet officially recognized.

Sampling was conducted probabilistically, in multiple stages, as recommended by the authors of studies in which the probabilistic theory of the quantitative approach to research is employed. The sampling process comprised three stages. The sampling units in the first stage were the following 8 neighborhoods: Ceilândia Sul, Ceilândia Norte, P Sul, P Norte, Setor O, Expansão do Setor O, QNQ and QNR. In the second stage, 32 census sectors were chosen by lots, four from each of the neighborhoods selected in the first stage. In the third stage, households were selected in census sectors chosen in the previous stage. The addresses were selected from the National Register of Addresses for Statistical Purposes, maintained by the Brazilian Institute for Geography and Statistics (CNEFE-IBGE) [11].

Data were collected by survey during home visits from May to July of 2014, by administration of an instrument such as that described in the World Health Organization's "Household Survey to Measure Access and Use of Medicine: Guidelines and Questionnaire" [12], with certain modifications.

The instrument was designed to trace the profile of the hypertensive population in terms of sex, age, weight, height, age at which SAH was diagnosed, socioeconomic status and behavioral habits relating to smoking, diet and physical activity. With relation to these behavioral items, respondents were asked whether they smoked or had previously smoked regularly, whether they avoided eating salt and whether they engaged in sports, physical exercise or recreational activities such as walking, running, aerobics, football, cycling, basketball, volleyball, weight training, yoga, Pilates or martial arts for at least 10 consecutive minutes.

Access to medications for treatment of SAH was investigated in terms of specifications and quantities of products needed; difficulties with acquiring and methods of payment for medications needed by the user; geographic access to pharmacies that stock antihypertensive medications; and acceptability and user satisfaction with relation to the medications used to treat SAH.

The data collected during the home visits were stored in electronic files using EPI DATA version 3.1 and double checked against the originals to test for possible input errors. In order to guarantee interviewee confidentiality, all data were anonymized prior to analysis. Quality control was conducted with a sample of 10% of the people studied.

For statistical analyses, descriptive data were expressed as means, standard deviations and frequencies. The Chi-square test was used for inferential and qualitative data. The Monte Carlo method was employed for qualitative variables that did not have a minimum of 5% of the sample in each cell. The *t* test for independent samples was used for parametric data and when distributions were not normal the Mann-Whitney test was used, when a difference of 0.001 was detected.

The study was approved by the Research Ethics Committee at the University of Brasília's Faculty of Health under protocol number 29298814.0.0000.0030. Before interviews all participants signed free and informed consent forms which explained the guarantees of anonymity, confidentiality of information and their rights to non-participation and to withdrawal from the study at any time.

3. Results

Figure 1 illustrates the sample distribution and the profile of patients with hypertension in terms of their indications for antihypertensive drugs and the medications they take.

Table 1 lists the variables that comprise the epidemiological profile, socioeconomic status and behavioral of habits of the people with hypertension investigated in Ceilândia.

The weight variable revealed that 75% (n = 24) of the men and 58.3% (n = 63) of the women were over their ideal weight. The active smokers in the sample of people with hypertension had started smoking at around 18.3 years of age, 93.7% (n = 15) smoked every day and they smoked a mean of 15.2 cigarettes per day. The ex-smoker had started smoking at a mean age of 18.4 and had quit at 38.6 years of age, which equates to an average of 22.2 years smoking. Reduced salt intake was reported by 90.7% of the sample of people with hypertension, 68.5% of whom had adopted this behavior in response to medical advice and 27.5% of whom had done so on their own initiative. Finally, 21.4% of the sample stated they engaged in physical activity and they exercised an average of 3 days per week, 60 minutes per day.

The questionnaire also contained items related to the SAH patients’ access to antihypertensive medications. The responses to these questions were converted into indicators, which are shown in **Table 2**.

4. Discussion

Many studies dealing with access to medications focus on the physical availability of products and barriers that make it difficult for users to adhere to drug treatments [15]-[17]. However, there is research showing the importance of expanding this perspective of the dimensions of access to healthcare, including pharmacotherapy, particularly in low-income countries [18]. These dimensions were investigated in the present study, resulting in indicators that enabled identification of the barriers that make it difficult for users to access medications to treat SAH.

Indicators related to the physical accessibility of antihypertensive medications show that these users found it difficult to acquire their drugs on almost one third of occasions and in some cases were unable to access any of these products. It should be pointed out that the greatest difficulty was reported with relation to accessing Brazilian National Health Service (SUS) pharmacies, followed by access to drugs via the “People’s Pharmacy” network.

There is evidence in the literature that the availability of antihypertensive medications in Brazil increased after implementation of the “Health Has no Price” program [19] [20], but also shows that there has been a steady reduction in the availability of these products through pharmacies belonging to the SUS [21]-[23]. This finding may be in part due to problems related to management and application of financial resources in these pharmacies [24]. Issues with availability of medications are not restricted to antihypertensive drugs since studies conducted in Brazil have shown that, on average, 40% of medications prescribed to treat chronic disease within the public

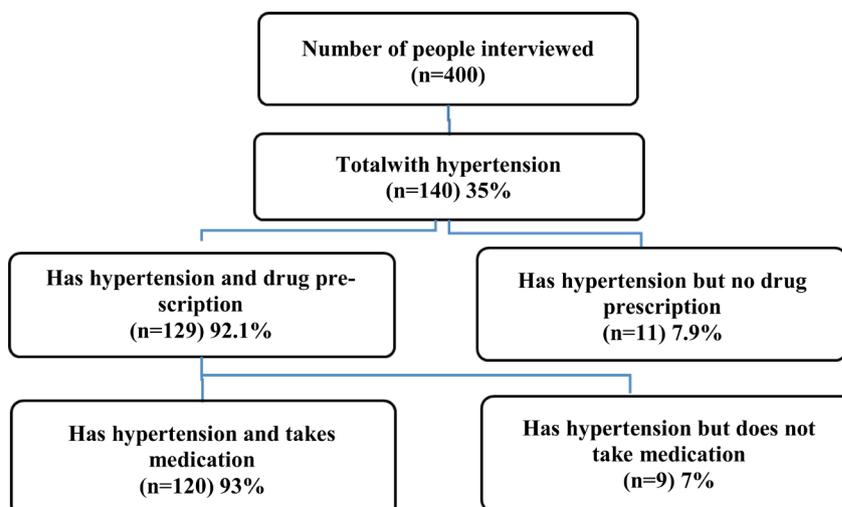


Figure 1. Sample distribution in terms of indications for and use of antihypertensive medication.

Table 1. Social, economic and behavioral profile of people with Systemic Arterial Hypertension in the city of Ceilândia, DF, Brazil.

	Men 22.9% (n = 32)		Women 77.1% (n = 108)		Total (n = 140)		P
Mean age \pm SD (years)	56.21 \pm 14		57.82 \pm 13.6		57.45 \pm 13.7		0.56
Age at SAH onset	46.03 \pm 13.9		42.17 \pm 11.7		43.08 \pm 12.3		0.14
BMI [13]	%	n	%	n	%	n	
Underweight	3.1	1	1.9	2	2	3	
Normal weight	21.9	7	24.1	26	24	33	
Overweight	43.8	14	32.4	35	35	49	0.30
Obesity class I	21.8	7	16.7	18	18	25	
Obesity class II	9.4	3	7.4	8	8	11	
Obesity class III	0	0	1.9	2	1	2	
Did not answer	0	0	15.7	17	12	17	
Habits	%	n	%	n	%	n	
Smokers	6.2	2	12.9	14	11.4	16	0.30
Ex-smokers	40.6	13	25.9	28	29.2	41	0.23
Engages in physical activity	15.6	5	23.1	25	21.4	30	0.36
Reduces salt intake	78.1	25	94.4	102	90.7	127	0.005
Skin color/race	%	n	%	n	%	n	
Brown	34.4	11	56.5	61	51.4	72	
White	37.5	12	21.3	23	25	35	0.15
Black	15.6	5	16.7	18	16.4	23	
Asian	9.4	3	4.6	5	5.7	8	
Indigenous	3.1	1	0.9	1	1.4	2	
Educational level	%	n	%	n	%	n	
Never studied	9.4	3	6.5	7	7.1	10	
Up to 5 years in education	6.3	2	28.7	31	23.6	33	0.008
Up to 8 years in education	21.9	7	25	27	24.3	34	
Up to 11 years in education	37.5	12	33.3	36	34.3	48	
More than 11 years	25	8	6.5	7	10.7	15	
Per capita income (Mean)	R\$1.535.68		R\$662.55		R\$862.12		0.001
Economic class [14]	%	n	%	n	%	n	
A	6.3	2	0.9	1	2.1	3	
B	68.8	22	36.1	39	43.6	61	0.001
C	18.8	6	49.1	53	42.1	59	
D	6.3	2	13.9	15	12	17	
Has health insurance	56.2	18	37.9	41	42.1	59	0.06

BMI: Body Mass Index.

health care system were not available when needed [25] [26].

This scenario is a challenge, since the majority of the Brazilian population has low incomes and is dependent on the public healthcare system for treatment and to dispense medications [27]. In common with the national situation, 88.8% of the population of Ceilândia use public health services and 98.6% seek care at healthcare centers in their own areas [10].

Table 2. Indicators of physical, financial and geographic access and acceptability of antihypertensive medications according to hypertensive residents of Ceilândia.

Indicators of physical accessibility of antihypertensive medications			
% of users with antihypertensive prescriptions who did not have access to their medication within the previous 30 days (n = 120)	14.1		(n = 17)
% of prescriptions for antihypertensive medications for which the recipient encountered some degree of difficulty in acquiring their medication (n = 198)	27.7		(n = 55)
% of the recipients who sought antihypertensive medication sat a pharmacy and could NOT obtain all the drugs they needed	SUS pharmacy (n = 68)	32.3	(n = 22)
	Private pharmacy (n = 95)	7.4	(n = 7)
	“People’s Pharmacy” (n = 62)	17.7	(n = 11)
% of prescriptions for antihypertensive medications for which the recipient did not find the drug at the pharmacy (n = 163)	SUS pharmacy	12.8	(n = 21)
	Private pharmacy	2.4	(n = 4)
	“People’s Pharmacy”	4.9	(n = 8)
% of responses that antihypertensive medications were not available at the pharmacy, including the responses “sometimes missing”, “almost always missing” and “always missing”	SUS pharmacy (n = 67)	83.6	(n = 56)
	Private pharmacy (n = 94)	14.9	(n = 14)
	“People’s Pharmacy” (n = 60)	33.3	(n = 20)
Indicators of financial accessibility of antihypertensive medications			
% of drugs for which recipient had to pay (n = 215)	35.3		(n = 76)
% of users who considered the price of medications “expensive” or “very expensive” (n = 120)	53.3		(n = 64)
% of users who did not take their medications because they were unable to pay for them (n = 120)	19.1		(n = 23)
% of users who stated that during the previous year they had been unable to buy a daily necessity, had to take out a loan or had to sell something to pay for costs incurred because of a health problem (n = 120)	12.5		(n = 15)
Indicators of geographical accessibility of antihypertensive medications			
% of users who did NOT consider it “difficult” to get to the pharmacy	SUS pharmacy (n = 68)	64.7	(n = 44)
	Private pharmacy (n = 93)	81.7	(n = 76)
	“People’s Pharmacy” (n = 59)	81.4	(n = 48)
% of users who did not go to collect drugs because of difficulty of getting to pharmacy	SUS pharmacy (n = 68)	4.4	(n = 3)
	Private pharmacy (n = 94)	4.2	(n = 4)
	“People’s Pharmacy” (n = 61)	3.3	(n = 2)
% of users who walk to pharmacy	SUS pharmacy (n = 68)	64.7	(n = 44)
	Private pharmacy (n = 94)	75.6	(n = 71)
	“People’s Pharmacy” (n = 61)	70.5	(n = 43)
% of users who considered the pharmacy a long distance away	SUS pharmacy (n = 68)	14.7	(n = 10)
	Private pharmacy (n = 94)	3.2	(n = 3)
	“People’s Pharmacy” (n = 61)	1.6	(n = 1)
Indicators of acceptability of and satisfaction with antihypertensive medications			
% of antihypertensive medications administered with which recipients stated they were satisfied (n = 203)	93.1		(n = 189)
% of antihypertensive medications administered with which recipients reported some type of discomfort or health problem related to taking the medication (n = 215)	4.7		(n = 10)

SUS = the Brazilian National Health Service (Sistema Único de Saúde).

Indicators related to financial accessibility of antihypertensive medications show that more than one third of this population pays for drugs with their own money. More than 50% of users stated that drug prices were “expensive” or “very expensive” with relation to their ability to pay, particularly for a population with an average per capita income that is close to the minimum wage. The finding that users are paying for drugs with their own money illustrates the lack of availability of these products in pharmacies belonging to the SUS and those on the “People’s Pharmacy” network, which should be assured by the state since this is a right that is covered by applicable legislation and financed by the country’s high rate of taxation.

As a result, almost 20% of the users failed to take the medications prescribed to treat SAH because they were unable to afford them. Access to medications can impose high costs on patients, to an extent that compromises basic requirements, if these medications cannot be acquired free of charge from the public health service [27]. Therefore, these findings are even more significant when the cost of drugs plays a decisive role on people’s financial viability, whether subsidized by governments or healthcare systems, paid for by the end-user or distributed free of charge [28].

Another relevant fact is that 25% of all families in Brazil pay for private health insurance and the majority of the Brazilian population is dependent on health care provided by the Brazilian National Health Service [29]. Data from the 2008 to 2009 Family Budgets Survey (Pesquisa de Orçamentos Familiares) show that the poorest families in Brazil spend 12% of their monthly per capita income on medications, whereas the richest families spend 1.7% [30]. It was also observed that some of the residents of Ceilândia were compromising part of their family incomes to pay for private healthcare or to service loans taken out in order to recover their health, including to pay for drugs.

Data from the WHO global health report reveal that the Brazilian government’s annual spending per citizen is less than the global average and that more than half of Brazilian health care spending is paid for directly from the pockets of the users [31]. On average, public spending in rich countries is more than five times what the Brazilian State spends [32]. Another finding in the WHO report is that in Brazil it is still the users who pay for health care, in the form of health insurance or private spending [31].

Inaccessibility of medications is also related to geographic barriers which are revealed by indicators of several obstacles to reaching the places where products are dispensed. Although in general the displacements required to reach pharmacies were not considered difficult by the majority of interviewees, it was among users of the pharmacies belonging to the SUS that the greatest dissatisfaction with traveling difficulties was observed, with the finding that 35% of these users are unable to get to the pharmacies on foot, which implies that they may must employ some form of transport, involving cost.

Recent studies that have investigated why people stop taking medication to treat chronic diseases found that the cost of transport and displacement is greater than the prices charged for the medications themselves and also revealed that if services and products are not available within an acceptable proximity, people decide not to use them, even if they are free [33]. Notwithstanding, it should be highlighted that the majority of the residents of Ceilândia with hypertension did not allow geographic barriers to prevent them accessing medications.

With regards to the indicators of acceptability of the antihypertensive medication and users’ satisfaction with them, the great majority stated that they were satisfied with their drugs and little discomfort and few health problems related to their use were reported.

The barriers preventing access to antihypertensive medications identified in this study converge on the difficulty that the Brazilian government faces to maintain free distribution of these essential medications, in line with the goals that it has established. These factors provoked sporadic interruption or even abandonment of drug treatments. With regard specifically to antihypertensive treatments, the possibility of severe systemic repercussions are well known, such as, for example, increased risk of strokes, acute myocardial infarction and impairment of renal function leading to kidney failure, among others [34]-[36].

When correctly employed, antihypertensive medication is associated with avoidance of a large number of all causes of deaths and hospitalizations due to cardiovascular diseases [35] [36]. However, since the etiopathogenesis of hypertension is multi factorial, management of this disease is not restricted to drug treatment alone. In view of this, the epidemiological profile of residents of the city of Ceilândia who have hypertension indicates a need for additional interventions, since the majority are overweight or obese, a minority of them engage in physical activity and 40% are smokers or ex-smokers.

With regard to other variables investigated, the large imbalance in sex distribution was of note, with many more females, which may be because more women were at home and able to take part in the survey and also

because they are more inclined to cooperate with research. We also found evidence that attempts to reduce dietary salt intake were more prevalent among women, while the men had higher incomes, had spent longer in education and had higher socioeconomic status. Notwithstanding, this significant difference in social and economic class was not enough to contribute to delaying onset of SAH among the men, when compared with the women, since both sexes were diagnosed with SAH in their fifth decades of life.

Several different studies have found a proportional relationship between obesity and SAH and according to the Ministry of Health, a reduction of 5% to 10% of body weight is enough to reduce blood pressure [37] [38]. Inactivity is another factor that contributes to elevated blood pressure and the correlation between inactivity, hypertension and cardiovascular mortality is well-established, which is why all guidelines on arterial hypertension recommend regular physical activity [39]. Many clinical trials have shown that reductions in blood pressure can be achieved with aerobic exercises and they are recommended for both prevention and treatment of SAH [38]. Smokers with hypertension are also more likely to develop severe forms of hypertension and they have twice the mortality of non-smokers [40].

The World Health Organization states that measures such as reducing salt intake, eating a balanced diet, practicing physical activities regularly and avoiding tobacco and harmful alcohol intake, can reduce the risk of hypertension [33]. Adopting healthy lifestyle habits contributes to prevention and treatment of chronic diseases and so the population should be encouraged to do so, in conjunction with ensuring continuous adherence to drug treatment.

Finally, there are limitations inherent to research employing population-based surveys. These are results based on self-reported measures and inaccuracies are possible. However, such surveys are an important mechanism for assessing the performance of health care systems, in dimensions such as access, utilization and degree of user satisfaction with health services.

The results reported here are an indication of the importance of investigating users' access to medications in a wider-reaching manner, considering additional dimensions that have an impact on the continuity of drug treatment. In view of the importance of the subject and of the need to improve understanding and the dimension of these issues, further similar studies should be conducted in order to support better targeting of activities in this area, expanding and improving access to medications, in order to contribute to improving the health conditions and the quality of life of the population that uses medications in this country.

5. Conclusions

Analysis of indicators of several different dimensions of access to antihypertensive medications, combined with epidemiological and behavioral data on people with SAH who are resident in Ceilândia revealed significant obstacles to the success of public health programs involving treatment of this morbidity.

Failure to keep the public health care system adequately supplied has had a negative impact on access to medications that are essential to treatment of hypertension and placed the costs on the users. Lack of access to medication results in discontinuation of treatment for hypertension, which can lead to the compensation of the disease and the serious consequences that this can have. This is a population that utilizes and is dependent on the Brazilian National Health Service for its healthcare and one which also has lifestyle habits considered to confer risk of exacerbation of the disease.

This scenario reveals a serious disconnect between pharmaceutical-based care and the social determinants of health and reveals a need for implementation of wider-ranging and more effective public policies that can ensure access to antihypertensive medications and will involve the participation of the users of the health care system in changing their habits and behaviors in order to achieve adequate and lasting control of systemic arterial hypertension.

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