

Availability of Medicines for the Population as a Determinant of the Sustainable Development of the National Health System

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ABSTRACT

The purpose of the study was to analyse the availability of medicines for the population on the example of the treatment of cardiovascular diseases in 2011 and 2019 to assess the assortment, financial and logistical availability of medicines as a determinant of the sustainable development of the national health system. A comparative and structural analysis of the availability of medicines for the treatment of diseases of the cardiovascular system was carried out according to the monitoring of the assortment and prices of vital and essential medicines in the Sverdlovsk Region for 2011 and 2019, including using the WHO's methodology and the International Non-governmental organization "Action Program for Health and Healthcare". The availability and prices of 274 medicines' trade names in the hospital and outpatient segments of the Sverdlovsk region revealed and the direct costs of patients for purchasing medicines for arterial hypertension treatment in 2019 estimated. As a result, of the study, according to data from 2011 and from 2019, in general, there was a decrease in prices relative to reference prices for generic drugs for the treatment of cardiovascular diseases. To increase the effectiveness of drug provision as a determinant of the sustainable development of the national health system, additional studies of price dynamics and pharmacoeconomical analysis needed, taking into account trends in the Russian pharmaceutical market.

Keywords: *Medicine prices, Availability of medicines, Procurement price, Pharmacy, WHO/HAI.*

1. INTRODUCTION

Increasing the availability of modern effective and safe medicines is one of the key tasks of success in achieving the goals of the national project "Healthcare" [1]. The modernization of the drug supply system for citizens as a multifaceted process that ensures the sustainable development of the national health system is in the focus of attention of the economy, the state and society.

A special place among the issues of reforming the system of drug provision for citizens are occupied by the problem of availability of medicines for the treatment of cardiovascular diseases due to a number of circumstances [2, 3].

The prevalence of cardiovascular diseases in the population is the reason for the negative economic impact and significant costs of public health systems for their treatment throughout the world. The basis of economic losses is the mortality from cardiovascular diseases and

the incidence of them in the working-age population, which leads to significant losses of human capital. According to experts, the total amount of economic damage from cardiovascular diseases can reach more than 2% of the gross domestic product in Russia [4].

In addition, it is obvious that cardiovascular diseases have an exceptional social importance due to their leading position in the structure of causes of death. Therefore, close attention to the treatment of cardiovascular diseases is quite justified and relevant.

It is known that the system of medical care for the treatment of cardiovascular diseases is represented by several interrelated stages: the outpatient stage (on the basis of polyclinics, consultative and diagnostic canthers, etc.), the stage of emergency medical care, the hospital stage (including in a day hospital), the rehabilitation stage. At each stage, in accordance with the established diagnosis and for medical reasons, the necessary drug therapy is carried out, the financing of which is carried

out in accordance with the structure of the state drug supply system at both the federal and regional levels.

The financial burden of treatment of cardiovascular diseases is imposed on the subjects of the Russian Federation within the framework of the implementation of territorial programs of state guarantees of free medical care to citizens, which contain, in addition to the allocated funds from the state budget, additional types and conditions of its provision, as well as additional volumes. However, to date, there are no clear criteria for the formation of regional drug supply systems for patients with cardiovascular diseases.

The analysis of medicines included in the list of regional programs of preferential drug provision for the subjects of the Russian Federation (2018) showed that the average number of medicines intended for the treatment of cardiovascular diseases in the regional context was 50, and in particular in the Sverdlovsk region - 25. At the same time, among the subjects of the Russian Federation, the Sverdlovsk Region ranks 23rd (when ranking from the best to the worst) in terms of the overall morbidity of the entire population, while an increase in the morbidity of the entire population has been noted in recent years compared to the average long - term level-by 35.0% in 2018 [5]. In the structure of morbidity of the adult population of the Sverdlovsk region, diseases of the circulatory system are leading, accounting for 11.4% of the total number of morbidity of the adult population of the Sverdlovsk region [6].

Thus, the problem of assessing the availability of medicines intended for the treatment of cardiovascular diseases at all stages of providing medical care to citizens for similar social groups in the regions of Russia is being updated.

Construct availability of medicines we understand the possibility for a patient to receive the necessary medicine at the right time and at an acceptable price for him or on preferential terms [7, 8, 9, 10].

Based on this, the key elements of the availability of medicines are:

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- assortment availability of medicines as their availability in sufficient volume and variety in accordance with the stage and type of treatment
- financial availability of medicines as an acceptable price and / or preferential conditions for obtaining
- logistical availability of medicines as the timeliness of their receipt and delivery in accordance with the stage and type of treatment.

The purpose of the presented work was to analyze the availability of medicines for the population on the example of the treatment of cardiovascular diseases in

2011 and 2019 to assess the assortment, financial and logistical availability of medicines as a determinant of the sustainable development of the national health system. (based on the materials of Monitoring the assortment and prices for VED in the Sverdlovsk region).

Among the tasks of the study, the following were considered:

- analytical evaluation of the product availability of drugs on the basis of changes of the range of drugs for the treatment of cardiovascular diseases in outpatient and hospital segments of the pharmaceutical market in the Sverdlovsk region for 2011 - 2019.;
- analytical evaluation of financial inclusion on the basis of changes in the prices of medicinal products for the treatment of cardiovascular diseases in outpatient and hospital segments of the pharmaceutical market in the Sverdlovsk region for 2011 - 2019.;
- analytical assessment of logistics availability based on the study of the conditions and consequences of import substitution of medicines for the treatment of cardiovascular diseases in the outpatient and hospital segments of the pharmaceutical market of the Sverdlovsk region for 2011-2019.

2. MATERIALS AND METHODS

To solve the tasks set, a statistical analysis of the average retail prices of the packaging of a medicinal product and the range of medicines for the treatment of cardiovascular diseases for the outpatient segment and the average prices of packaging by trade name for the hospital segment in the Sverdlovsk region for 2011-2019 was carried out. In addition, the methodology of the World Health Organization and the International Non-governmental Organization "Program of Action for Health and Healthcare" (Health Action International, HAI) and (WHO/HAI) was used to analyze the financial availability of medicines [11].

The information base of the study was the data of Monitoring the assortment and prices for vital and essential medicines (VED) in the Sverdlovsk region for the period 2011 - 2019. with a step equal to 2 years. The database contains more than 200 thousand accounts entered by the subject of the Russian Federation, most of which (from 80 to 88%) belong to the outpatient monitoring segment, and from 20 to 12% to the hospital segment.

The qualitative analysis was based on the results of in – depth and semi-structured interviews with experts-representatives of medical organizations and pharmacies, the Ministry of Health of the Sverdlovsk Region, Roszdravnadzor in the Sverdlovsk region.

3. RESULTS AND DISCUSSION

3.1. Assortment Availability

The assessment of the assortment availability of medicines was carried out on the basis of a structural and comparative analysis of the main groups of medicines from the list of VED for the treatment of cardiovascular diseases in the Sverdlovsk region for the period from 2011 to 2019 for the outpatient and hospital segment, including international nonproprietary names and trade names, in monetary and physical terms.

The analysis of the structure of medicines by trade names and international nonproprietary names in the outpatient and hospital segments for the period under review shows that the number of positions of international nonproprietary names is increasing, while the number of medicines by trade names is decreasing, which indicates a decrease in assortment availability (Figure 1).

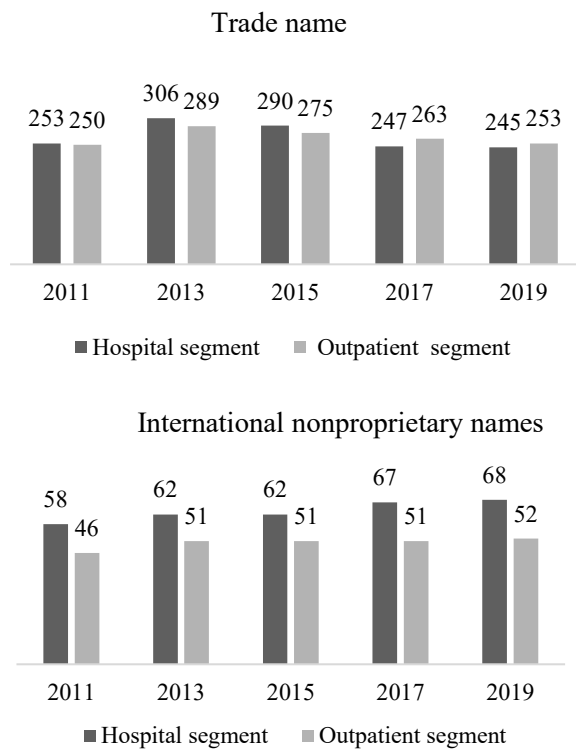


Figure 1 Dynamics of changes in the number of VED by trade names and international nonproprietary names

A structural analysis of therapeutic classes of drugs for the treatment of cardiovascular diseases in the Sverdlovsk Region in 2019 for the outpatient and hospital segment in physical terms revealed an increase in the share of generic drugs in the hospital segment compared to the outpatient one. A possible reason for this fact is the financial constraints associated with the capabilities of medical organizations.

In addition, it was found that the patient's transition from the hospital to the outpatient segment was accompanied by a structural shift in the consumption of medicines: the share of original drugs increased, there was a shift in favor of more expensive generics, or medicines supported by preferential drug provision.

3.2. Financial Availability

To assess financial availability, a statistical and pharmacoeconomical analysis of the direct costs of drug therapy for arterial hypertension in 2019 was carried out. According to the clinical recommendations for the treatment of hypertension, five classes of drugs are used for starting pharmacotherapy (diuretics, beta-blockers, calcium antagonists, ace inhibitors, angiotensin II receptor blockers), which are equally suitable for initial drug treatment in the form of monotherapy and in combination with each other, depending on the severity of the disease.

For the outpatient segment, in accordance with the WHO/HAI methodology, a reference group was formed based on the list of VED for the treatment of arterial hypertension. Prices for the final consumer were recorded and presented as median consumer price ratio of selected medicines (MPR) from the International Index of Drug Prices of the organization Management Sciences for Health [12].

According to the WHO/HAI methodology, it is considered that if the value of the MPR ≤ 1 , then the prices are acceptable.

During the study, there was a decrease in prices for both generic and original drugs. The most affordable drug throughout the entire study period is the diuretic furosemide, and the most expensive is amlodipine. The price of the most expensive drug (amlodipine 10 mg) in 2019 exceeded the international reference price by 69.85 times (Table 1).

In 2019, the cost of an annual course of drug therapy for arterial hypertension ranged from 170 to 23597 rubles and depended not only on the type of drug, but also on the choice of a specific drug within one therapeutic class. Thus, treatment with generic metoprolol was 5.5 times higher than treatment with other generic drugs of the beta-blockers group (Table 2).

According to the WHO/HAI methodology, drug provision is considered affordable if a one-month course of treatment for a chronic disease requires less than the one-day salary of a low-paid low-skilled worker.

Table 1. Statistical analysis of the final prices of drugs for the treatment of arterial hypertension in the outpatient segment

Parameter	2011		2019	
	Brand name	Generic	Brand name	Generic
MPR	16,34 [1,73 - 64,29]	3,63 [2,65 - 10,28]	14,11 [1,7 - 37,92]	2,5 [1,67 - 5,64]
Minimum	0,61 (furosemide, 40 mg)	0,13 (furosemide, 40 mg/ml)	0,33 (furosemide, 40 mg)	0,13 (furosemide, 40 mg/ml)
Maximum	140,04 (amlodipine, 10 mg)	23,03 (simvastatin, 20 mg)	69,85 (amlodipine, 10 mg)	11,99 (simvastatin, 20 mg)
Number of drugs	13	20	11	20

Table 2. Cost of annual pharmacotherapy for arterial hypertension in 2019, rubles

Therapeutic class	Trade name of the drug	Brand name	Generic
Diuretics	Hydrochlorothiazide 25 mg	1 687	-
	Spirolactone 25 mg	3 787	-
	Furosemide 40 mg	170	431
Beta-blockers	Atenolol 50 mg	780	-
	Bisoprolol 5 mg	2 713	5 017
	Metoprolol 50 mg	4 305	23 597
Calcium antagonists	Amlodipine 5 mg	886	6 100
	Verapamil 40 mg	1 737	-
	Nifedipine 20 mg	1 680	-
Angiotensin converting enzyme inhibitors	Lysinpril 10 mg	2 059	-
	Elanopril 5 mg	1 479	3 727
Angiotensin II receptor blockers	Losartan 50 mg	1 359	3 607

The analysis showed that the average price availability of generic drugs was high, and the employee with the lowest salary could purchase the drug for a month's therapy, spending less than a one-day salary. Among the original medicines were unavailable (Metoprolol 50 mg), for the purchase of which the employee spent more than five days' salary.

3.3. Logistics Availability

The assessment of logistics availability was carried out by conducting a comparative analysis of the volumes of substitution of original medicines with generic drugs, as well as the volumes of substitution of medicines produced by Russian pharmaceutical companies with medicines from foreign manufacturers from 2011 to 2019.

When assessing the logistical availability, the continuity of drug therapy for the treatment of cardiovascular diseases in the hospital and outpatient segments was analyzed in order to determine the degree of replacement of original drugs with generic drugs (Figure 3), as well as medicines from foreign manufacturers with Russian-made medicines (Figure 4).

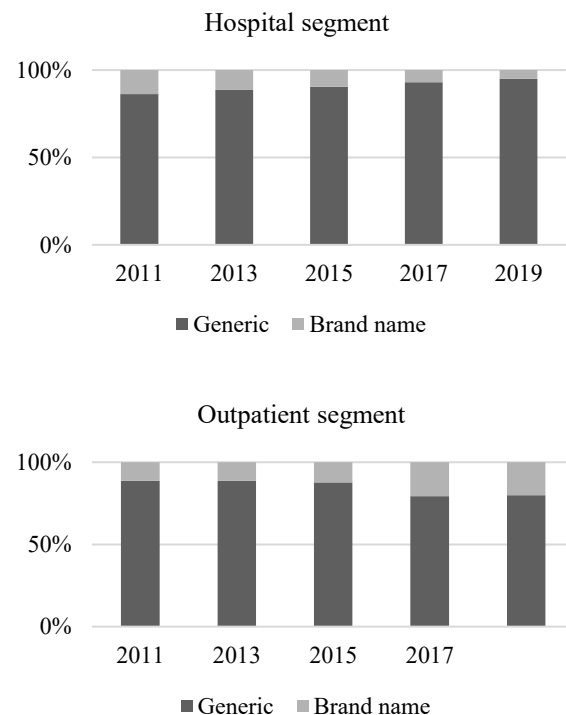


Figure 3 Dynamics of changes in the ratio of consumption of generic drugs and original brands in the hospital and outpatient segments

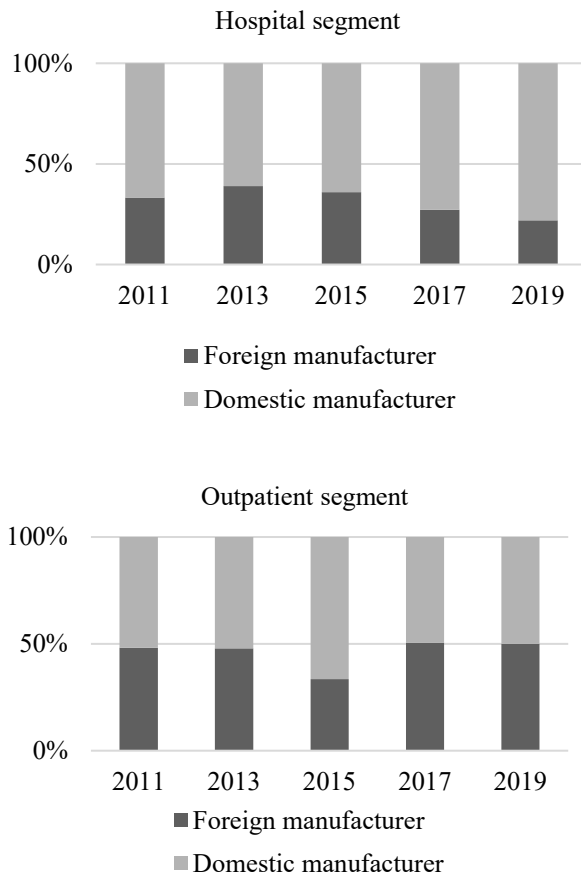


Figure 4 Dynamics of changes in the ratio of consumption volumes of drugs of foreign and domestic production in the hospital and outpatient segments

During the transition from the hospital to the outpatient segment, continuity is disrupted: cheaper generic drugs are replaced by expensive original drugs produced by foreign manufacturers.

4. CONCLUSIONS

In contrast to the existing studies on this issue, the paper attempts to analyze the availability of medicines for the population on the example of the treatment of cardiovascular diseases in 2011 and 2019 to assess the assortment, financial and logistical availability of medicines as a determinant of the sustainable development of the national health system.

As a result of the analysis of assortment availability, it was found that:

- for all therapeutic classes, the share of generic drugs in the hospital segment is higher than in the outpatient segment.
- the patient's transition from the hospital to the outpatient segment is accompanied by a structural shift in the range of medicines: the share of original

drugs increases, there is a shift in favor of more expensive generics.

The analysis showed a number of limitations of financial availability:

- the price availability of original brands in the study period decreases in comparison with generics.
- the cost of an annual course of treatment, depending on the choice of the drug, ranged from 170 to 23,597 rubles (according to 2019 data).
- the average price availability of generic drugs is growing, and the employee with the lowest salary could purchase a drug for a month's therapy, spending less than a one-day salary. Among the original medicines, there were inaccessible ones, for the purchase of which the employee spent more than five days' salary.

Analyzing the logistical availability, it can be argued that increasing the availability of generics reduced the burden of the disease for the state, but it is important for patients to make a rational choice of medicines to ensure the most effective, safe and least expensive pharmaceutical therapy.

Thus, having carried out an analytical assessment of the availability of medicines as determinants of the sustainable development of the national health system, the following conclusions were made: drug provision at the outpatient stage is carried out at the expense of the state for socially unprotected groups of the population, in turn at the hospital stage – due to the funds of the territorial Fund of compulsory medical insurance from the list of VED, there is no continuity in the formation of the list for the hospital and outpatient stages of medical care, which reduces the overall level of availability of medicines.

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