



## **Research on Meeting the Demand of the Population for a Group of Medicines Intended for the Treatment of Skin Diseases**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author MMR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MAE and APK managed the analyses of the study. Authors TAK, VVG, IGS managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The problem of the spread of skin diseases in Russia and abroad in the last period is quite acute. Among the reasons for the development of this group of diseases, researchers determine genetic factors, poor ecology, impaired liver function, etc. In this regard, those suffering from this group of diseases are necessarily provided with qualified medical care, and pharmacy institutions form the necessary range of drugs that can improve the standard of living of patients. For this reason, we

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consider it necessary to analyze the level of demand for certain drugs used for the treatment of skin diseases in the pharmacy network of Belgorod, as well as factors that allow us to assess certain aspects that affect the formation of the range of these drugs in pharmacies.

The purpose of the work was defined as follows: to conduct a study of meeting the demand of the population for groups of medicines intended for the treatment of skin diseases. The conducted analysis shows the following. Drugs intended for the treatment of skin diseases are in high demand (59.09%); 22.73% of drugs are in low demand, the lack of demand was observed in 18.18% of the studied group of drugs.

In this paper, recommendations were formulated to optimize the assortment policy of the World of Medicines pharmacy chain in Belgorod. Since it was determined that high demand drugs such as Argosulfan, Belosalic, Avekort, Cinocap, Candiderm, Alorom, Lomaherpan, and, Nitrofungin. It is for this reason that it is necessary to increase the volume of their purchases to better meet the demand of the population for these drugs.

It was also revealed that it is necessary to reduce the volume of purchases of drugs, the demand for which is reduced. It is drugs such as Daktarin, Adolen, Camadol, Ammifurin, Bramisil, Batrafen, and Hiporhamin (they came in the results of ABC-analysis to the group C). In addition, the pharmacy should promote this group of drugs to familiarize consumers with them and offer them at a reduced price, so as not to burden the turnover of medicines and not to reduce the effectiveness of the pharmacy.

The paper concluded that, according to the study, the demand for medicines used in the treatment of skin diseases is quite high. At the same time, the administration of the pharmacy chain should pay more attention to the analysis of the purchased groups of medicines in this category in order to prevent overloading the pharmacy balance with drugs, the demand for which is reduced, as this negatively affects the effectiveness of the pharmacy organization. In this regard, it is advisable to conduct an ABC analysis of the assortment groups of drugs at least once a quarter, as well as take the necessary measures to promote drugs used in the treatment of skin diseases that are in insufficient demand among the population.

*Keywords: Group of medicines; treatment of skin diseases; ABC analysis; coefficients of the breadth and depth of the assortment.*

## 1. INTRODUCTION

If we consider the range of modern pharmacies, we can see that along with medicines prescribed by doctors for acute respiratory infections, influenza, allergies and other diseases, one of the leading places is occupied by drugs that allow patients to relieve symptoms or cope with skin diseases [1]. The etiology of such diseases has a fairly wide range, in this regard, the group of these drugs is also numerous [2].

Today, pharmaceutical manufacturers offer patients a wide range of medicines of this group, and pharmacy organizations can present them at their exhibition expositions in a fairly wide range. However, a very important aspect here is the reliance on the demand of the population for these drugs: the study of the demand for these drugs will allow the pharmacy to meet the demand of the population for them, as well as make the pharmacy more cost-effective, since the demand for the presented drug range increases the turnover of drugs in the pharmacy and the level of its profit [3].

The demand of consumers today forms the supply in the pharmaceutical market, accordingly, the managers of pharmacies and pharmacy chains need to constantly conduct appropriate monitoring in order to respond to market signals in time and offer consumers the necessary medicines in accordance with their requests [4].

The purpose of the study is to conduct a study of meeting the demand of the population for a group of medicines intended for the treatment of skin diseases.

## 2. MATERIALS AND METHODS

The analysis was carried out on the materials of the pharmacy network "World of Medicines", which operates in Belgorod. In the process of writing the work, the calculation method, the graphical method, and the comparative method were used. The materials obtained in the course of the analysis were presented in a tabular form, they were analytically described and proved.

### 3. RESULTS

According to the Russian population morbidity data, about 11.4% of the Russian population suffers from acute and chronic skin diseases.[5] The peculiarity of such diseases is that they are aggravated by various factors (stress, weather conditions, contact with various allergens, etc.). For this reason, today the pharmaceutical market offers consumers medicines of a complex scope of action used for the treatment of skin diseases that can take into account certain negative factors of the development of the disease [6].

One of the areas of analysis is the analysis of demand [7]. The analysis of the demand for drugs sold in the pharmacy network "World of Medicines" in Belgorod was carried out. The analysis had been conducted for three months, from 1.04.2020 to 30.06, 2020. The total number of visitors to the pharmacy for this period was 35,651 people. The results of the analysis of the demand for the drugs being analyzed were summarized in Table 1.

Table 1. shows that in most cases, the demand for medicines intended for the treatment of skin diseases is high. The structure of demand for the studied group of drugs is presented in Table 2. and in Fig. 1.

Based on Fig. 1. it can be argued that drugs intended for the treatment of skin diseases are in high demand (59.09%); 22.73% of drugs are in low demand, and 18.18% of the studied group of drugs were not in demand.

### 4. DISCUSSION

In the course of the study, we calculated a number of indicators that could describe the range and pricing policy in numerical terms [5].

It is necessary to analyze a number of coefficients that allow us to characterize the assortment [6]. Table 3. shows the coefficients of indicators of the range of medicines intended for the treatment of skin diseases.

**Table 1. Analysis of the demand for medicines intended for the treatment of skin diseases**

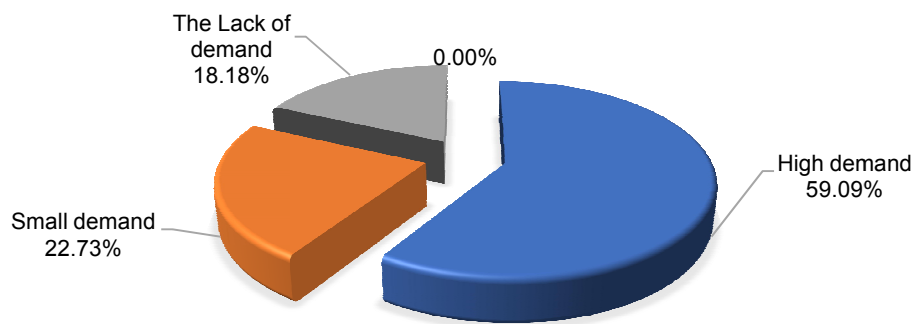
<b>№ n/n</b>	<b>Name of the medicinal product</b>	<b>Demand</b>
1	Abisib	High
2	Avekort	High
3	Adolen	Small
4	Alorom	High
5	Ammifurin	Lack of demand
6	Argosulfan	High
7	Batrafen	Small
8	Berestin	High
9	Belosalic	Small
10	Bramisil	High
11	Hiporhamin	High
12	Daktarin	Lack of demand
13	Kalanchin	High
14	Candiderm	Small
15	Camadol	High
16	Lomaherpan	High
17	Metrogyl	High
18	Nitrofungin	Lack of demand
19	Powercort	Small
20	Terbix	High
21	Cinocap	High
22	Erazaban	Lack of demand

**Table 2. The structure of demand for medicines intended for the treatment of skin diseases**

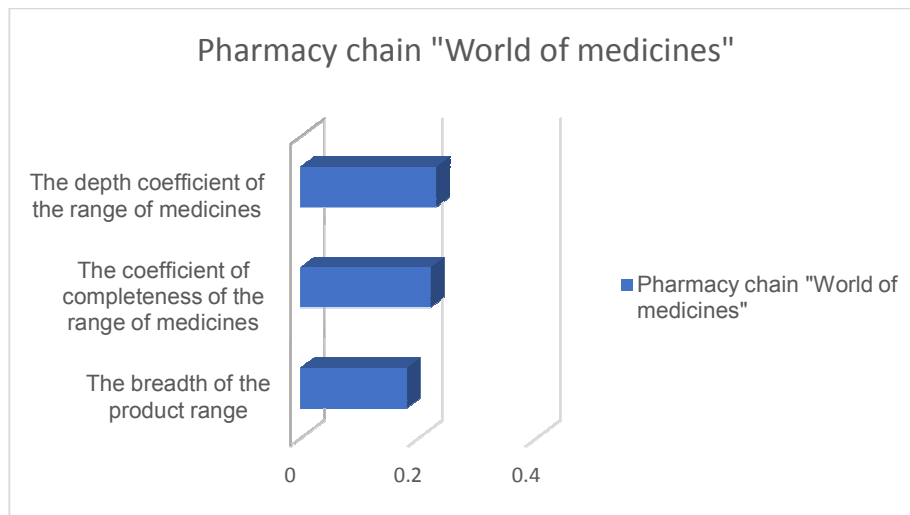
<b>Total</b>		<b>Strong demand</b>		<b>Small demand</b>		<b>Lack of demand</b>	
<b>abs.</b>	<b>Share%</b>	<b>abs.</b>	<b>Share %</b>	<b>abs.</b>	<b>Share %</b>	<b>abs.</b>	<b>Share%</b>
22	100,0	13	59,09	5	22,73	4	18,18

**Table 3. Coefficients of assortment indicators**

No.	Formula for calculating product range indicators	Pharmacy chain "World of medicines"
1	The breadth of the product range $B=B_{fact}/B_{base}$	0,18
2	The coefficient of completeness of the range of medicines ( $K_p$ ) $K_p=P_f/P_6$	0,22
3	The depth coefficient of the range of medicines ( $K_q$ ) $K_q=\Gamma_f/\Gamma_b$	0,23
1	The structure of the assortment Share % = $A_q/A_0 \cdot 100\%$	15,60
2	The degree of updating ( $Y_o$ ) $Y_o = m/A_0$	0,13



**Fig. 1. Structure of price categories of medicines intended for the treatment of skin diseases**



**Fig. 2. Indicators of the coefficient analysis of the range of medicines used in the treatment of skin diseases sold in the pharmacy network "World of Medicines"**

Based on the conducted research, when calculating the assortment indicators, it was revealed that the breadth of the assortment was 0.18. This coefficient should be  $> 1$  [7], the result does not meet the standard.

The coefficient of completeness of the range amounted to 0.22 that corresponds to the norm (the norm of  $KP > 1$ ).

The depth ratio range was 0.23, which does not meet the criterion value ( $Kg > 1$ ) [8].

The coefficient of the product range structure was 15.60%.

The coefficient of the degree of renewal was 0.13.

Also, to analyze the demand for medicines, it is necessary to conduct an ABC analysis of the range of medicines intended for the treatment of skin diseases sold in the network of pharmacies "World of Medicines" in Belgorod.

There are successive stages of ABC analysis [9]:

1. The determination of:
  - the period of the analysis was made;
  - the structures in which the analysis was carried out;
  - analyzed objects-drugs used in the treatment of skin diseases.
2. The list of medicines consumed during the analyzed period in the corresponding organizational structure was compiled and the purchase prices were indicated.
3. The amount of each of the consumed medicines was determined.
4. The total financial costs of the health care facility for each consumed drug for the period were calculated.
5. Medicines were ranked in descending order of their costs.
6. The share of costs for each drug as a percentage of the total cost of medicines and the share with the cumulative total (cumulative percentage) were calculated sequentially for all medicines included in the analyzed ranked list.
7. Groups of drugs were allocated according to the sum of all costs for their purchase: A-80% of costs; B-15%; C-5%. In group A, as a rule, there are from 10 to 20% of all consumed medicines, in group B-another 10-20%, in group C-60-80%. Based on the Pareto principle, controlling the consumption of medicines belonging to group A can significantly affect the rationality of spending financial resources.

Calculations based on the ABC analysis method for the 3rd quarter of 2020 are presented in Table 4.

Demonstrate the sequence analysis of the range by the method of AVS on the example of the drug Metrogyl:

1. Determine the amount of sales of drugs for the 3rd quarter in € total amount in the group of drugs intended for the treatment of skin diseases:  $1090,40 + 1193,70 + 1372,00 = 3656,10$  RUB;
2. Determine the proportion of total turnover attributable to the sales amount of each HP, in percent:  $3656,10 * 100\% / 60768,60 = 6,02\%$ ;
3. We rank the sales shares: from the maximum sales share to the minimum;
4. Calculate the cumulative sum of the sales shares (in %) by adding the following successively to the first share:  $14,36 + 11,29 + 11,21 + 7,43 + 7 + 6,67 + 6,39 + 6,02 = 70,37\%$ ;
5. According to the calculations we draw conclusions about what drugs Argosulfan, Belosalic, Avekort, Cinocap, Candiderm, Alorom, Lomaherpan, Metrogyl, the last time are 75,71% of the total share in turnover. They can be attributed to the Group of goods A.

The drugs Powercort, Terbix, Kalankhin, Erasaban, Abisib account for 16.64% of the total share in the turnover. They can be attributed to the product Group B.

Drugs - Daktarin, Adolen, Camadol, Ammifurin, Bramisil, Batrafen, Berestin, Hiporhamin leave of 7.65 of the total share in turnover. These are Group C products.

With the help of the analysis, the following conclusions can be drawn:

1. The most significant activities of the organization should be directed to the purchase and sale of Group A drugs (Argosulfan, Belosalic, Avekort, Cinocap, Candiderm, Alorom, Lomaherpan, Metrogyl, Nitrofungin);
2. it is Necessary to reduce costs in other areas by eliminating unnecessary functions and types of work (in particular, decrease / stop buying drugs group (Daktarin, Adolen, Camadol, Ammifurin, Bramisil, Batrafen, Berestin, Hiporhamin), and recommended active efforts to promote these "stale" products. For example, holding various events to build customer loyalty, promotions, discounts in pharmacies.

**Table 4. Ranking of drugs used for the treatment of skin diseases, according to the ABC analysis**

№	Name of the drug	Sales volume, RUB.			Total for the quarter, RUB.	Share in turnover, %	Semi-invariant, %	Group ABC
		July	August	September				
1	Argosulfan	3564,00	2339,00	2821,00	8724,00	14,36	14,36	A
2	Belosalic	0,00	2778,00	4080,00	6858,00	11,29	25,65	A
3	Avekort	2136,80	1479,50	3197,50	6813,80	11,21	36,86	A
4	Cinocap	2006,70	941,00	1569,80	4517,50	7,43	44,29	A
5	Candiderm	1246,00	1371,30	1639,00	4256,30	7	51,29	A
6	Alorom	0	1673,00	2383,00	4056,00	6,67	57,96	A
7	Lomaherpan	936,20	978,70	1966,40	3881,30	6,39	64,35	A
8	Metrogyl	1090,40	1193,70	1372,00	3656,10	6,02	70,37	A
9	Nitrofungin	560,00	1567,50	1120,00	3247,50	5,34	75,71	A
10	Powercort	726,00	1019,00	1092,00	2837,00	4,67	80,38	B
11	Terbix	1056,20	950,80	342,70	2349,70	3,87	84,25	B
12	Kalanchin	735,40	470,60	547,90	1753,90	2,89	87,14	B
13	Erasaban	684,80	943,70	0,00	1628,50	2,68	89,82	B
14	Abisib	850,00	686,00	0,00	1536,00	2,53	92,35	B
15	Daktarin	563,00	690,00	230,00	1483,00	2,44	94,79	C
16	Adolen	350,00	235,00	200,00	785,00	1,29	96,08	C
17	Camadol	255,00	255,00	85,00	595,00	0,98	97,06	C
18	Ammifurin	0,00	0,00	545,00	545,00	0,9	97,96	C
19	Bramisil	0,00	240,00	240,00	480,00	0,79	98,75	C
20	Batrafen	180,00	190,00	0,00	370,00	0,6	99,35	C
21	Berestin	255,00	0,00	0,00	255,00	0,42	99,77	C
22	Hiporhamin	0,00	35,00	105,00	140,00	0,23	100	C

## 5. CONCLUSION

The conducted analysis shows the following. Drugs intended for the treatment of skin diseases are in high demand (59.09%); 22.73% of drugs are in low demand, the lack of demand was observed in 18.18% of the studied group of drugs.

Analysis of the main indicators of the range of drugs used in the treatment of skin diseases revealed that almost all indicators are below the critical values.

In the work, an ABC analysis was carried out. According to the calculations, the preparations Argosulfan, Belosalic, Avekort, Cinocap, Candiderm, Alorom, Lomaherpan, Metrogyl, the last time are 75,71% of the total share in turnover. They can be attributed to the Group of goods A.

The drugs Powercort, Terbix, Kalanchin, Erasaban, Abisib account for 16.64% of the total share in the turnover. They can be attributed to the product Group B.

Drugs Daktarin, Adolen, Camadol, Ammifurin, Bramisil, Batrafen, Berestin, Hiporhamin leave of 7.65 of the total share in turnover. These are Group C products.

Recommendations for optimizing the assortment policy of the World of Medicines pharmacy chain in Belgorod are formulated.

- 1) High demand drugs such as Argosulfan, Belosalic, Avekort, Cinocap, Candiderm, Alorom, Lomaherpan, Metrogyl, Nitrofungin. It is for this reason that it is necessary to increase the volume of their purchases to better meet the demand of the population for these drugs.
- 2) It is necessary to reduce the volume of purchases of drugs, the demand for which is reduced. It is drugs such as Daktarin, Adolen, Camadol, Ammifurin, Bramisil, Batrafen, Berestin, Hiporhamin (they came in the results of ABC-analysis to the group). In addition, the pharmacy should promote this group of drugs to familiarize consumers with them and offer them at a reduced price, so as not to burden the

turnover of medicines and not to reduce the effectiveness of the pharmacy.

Accordingly, according to the study, the demand for medicines used in the treatment of skin diseases is quite high. At the same time, the administration of the pharmacy chain should pay more attention to the analysis of the purchased groups of medicines in this category in order to prevent overloading the pharmacy balance with drugs, the demand for which is reduced, as this negatively affects the effectiveness of the pharmacy organization. In this regard, it is advisable to conduct an ABC analysis of the assortment groups of drugs at least once a quarter, as well as take the necessary measures to promote drugs used in the treatment of skin diseases that are in insufficient demand among the population.

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The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

#### CONSENT

It is not applicable.

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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