

Marketing analysis of the required drugs in pharmacies

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ABSTRACT

The search for new solutions in management and marketing for pharmacies has been particularly relevant in terms of the combination of economic and social functions in pharmaceutical activities. The focus of the pharmacy on the economic and trade component may lead to a decrease in the availability of drug supply to the population. A competent product mix policy of a pharmacy can be one of the solutions for maintaining a balance between the components of the pharmacy business. The analysis of the required drugs in pharmacies from four regions of the Russian Federation for 2018 has been presented in the article. The use of the rationality factor for evaluating and forming the list of required drugs in the marketing analysis has been scientifically justified for improving the quality of drug supply to the population and the tool for optimizing the activities of a pharmacy. The problems of preparing the list of required drugs in pharmacies have been identified based on the obtained results, and reserves for improving the quality of outpatient drug supply have been proposed.

Keywords: availability of drug supply, list of vital and essential medicines, rationality factor, required drugs

Introduction

New techniques and devices are introduced to the market annually.^[1] Notwithstanding the fact that pharmacy practice in community pharmacies has revealed improvement to some extent, during the last few years, it has not completely gained the belief of the public or other health experts, yet.^[2] Various methods have been used today to analyze the product mix of a pharmacy, depending on the goals set in the marketing research. Today, the development of an analytical method for the determination of active pharmaceutical ingredients and preservative compounds in pharmaceutical products is needed to maintain the quality in order to be in the range of product standards.^[3] In most cases, this can be an analysis of the product

mix and the use of drugs in the pharmacotherapy of outpatients and inpatients. The information obtained in the course of such studies allowed forming a rational product mix policy of the pharmacy organization depending on the market demand and supply for certain drugs.

It must be noted that the determinative factor of the product mix policy of a pharmacy is the institutional norm stipulated in Federal Law No. 61-FZ dated 12.04.2010 on "drug circulation", which required retail drug companies to ensure the continued availability of the required drugs approved by the Government of the Russian Federation, and established in accordance with the procedure established by it.^[4]

Due to this, the development of methodological approaches and the optimization of certain aspects of drug management requirements has been a relevant research problem, the solution of which has been intended to improve the availability of drug supply to the population by increasing the efficiency of a pharmacy. It is important to note that the base for drug management requirements has been a list of vital and essential medicines (VEM), the price for which has been regulated by the state.^[5-8]

The task of the regulated VEM list has been to increase the availability of drugs for the public and healthcare facilities in the

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provision of medical care, under state guarantees (emergency medical care, inpatient care, specialized outpatient and inpatient care, and a significant number of drugs sold in the commercial sector).^[5] The list has been developed in order to ensure that the population of the country has had access to the most demanded and necessary drugs for medical care.^[9, 10]

Russia is a huge country with different natural climatic zones and many peoples and ethnic groups living in its territory.^[11] Today, the issue of harmonization and approval of the list of the regionally required drugs that most correspond to the morbidity structure of a certain region of the Federation is relevant. The authors developed a method for determining the financial load (burden) on a pharmacy if a drug was included in the list of required drugs earlier, in order to reduce the adverse economic impact of the institutional norm. A universal integral indicator was justified and proposed, which included the main parameters forming the degree of availability of a drug included in the list.^[12] The authors suggested using the rationality factor as an indicator of a rational product mix in this study in order to maintain a balance of interests.

The rational list of the required drugs for a pharmacy was understood as a list that most fully satisfied the reasonable needs of the population in the region, the requirements of the existing regulations, and the modern scientific developments, and ensured the competitiveness of the pharmacy.

Materials and Methods

The objects of the study were regulatory legal acts establishing the obligation to form the lists of the required drugs for pharmacies, the procedure for their formation; the range of drugs included in the list, the analytical data on the main indicators of the pharmaceutical market development,^[13] the experimental data of sociological research of consumers, the operational data of pharmacies on product mix positions from the list and on the number of trade names with the corresponding dosage forms represented in the markets of the Bryansk, Kursk, Oryol, and Tula regions. The authors used a set of scientific methods of system, logical, marketing, and structural types of analysis in the course of the study. The following tasks were solved to achieve the goal:

1. To study the morbidity structure of the population in the regions under study and to determine its role in the formation of the list of required drugs;
2. To determine the rationality ratio for the list of required drugs;
3. To study the ratio of manufacturers in the pharmaceutical market for the studied nosology; and
4. To establish the ratio of drugs from the VEM list in the various price ranges for the treatment of the studied nosology.

The main diseases for the regions under study and the available drugs for their treatment in the list of required drugs were identified to solve these tasks at the first stage based on the structural analysis. The rationality factor of the product mix was

the most informative among all the analyzed indicators in merchandising analysis, according to the authors.

The *rationality factor* for the product mix was the weighted average of the main marketing characteristics of the product mix, multiplied by the weighting factor. The weighting factor described the significance of the indicator and was determined using an expert method.^[14]

$$Fr = (Wr \times Fb + Wc \times Fc + Ws \times Fs + Wn \times Fn),$$

where Kr is the rationality factor;

Wr is the weighting factor of the range;

Wc is the weighting factor of completeness;

Wn is the weighting factor of novelty;

Ws is the weighting factor of stability;

Fb is the factor of the range breadth;

Fc is the factor of the range completeness;

Fn is the factor of the range novelty; and

Fs is the factor of the range stability.

The marketing indicators of the product mix should be found in the first place, which forms the basis for finding the rationality factor of the product mix; its breadth, completeness, stability, the degree of the update should be estimated.

The *breadth factor* is the ratio of the actual number of the product mix groups to the basic breadth:

$Fb = Ba/Bb$, where Ba is the actual breadth, and Bb is the basic breadth.

The *completeness factor* is the ratio of the number of the product mix positions available in a pharmacy to the number of the product mix positions entered into the State Register of Medicines:

$Fc = Ca/Cb$, where Ca is the actual completeness, and Cb is the basic completeness.

The *stability factor* is the ratio of the number of commodity units in steady demand to the actual saturation of the product mix:

$Fs = S/Ba$, where S is the indicator of stability, and Ba is the actual breadth.

The *novelty factor* is the ratio of the number of new products to the actual saturation of the product mix in this group:

$Fn = N/Ba$, where N is the indicator of novelty, and Ba is the actual breadth.

All indicators for each of the four regions of the central federal district (CFD) were found.

Bryansk region

Due to the prevailing nosology of the Bryansk region, the minimum product mix should be represented mainly by five ATC – groups of the minimum list (Ba):

- Respiratory system;
- Nervous system;
- Sense organs;
- Digestive tract and metabolism; and
- Musculoskeletal system.

The total number of groups of the required drugs was nine (Bb).
 $Fb = 5/9 = 0.55$.

The product mix of groups of drugs that were in demand in the region was represented by 210 registered trade names (Ca) in various dosage forms. A total of 1,082 trade names (Cb) were registered in the state register with the appropriate dosage forms from these groups of the required drugs.

$$F_c = 210/1,082 = 0.194.$$

139 commodity units were in a steady demand in regional pharmacies, while a total of 210 were represented:

$$F_s = 139/210 = 0.662.$$

Over the studied period, 56 new trademarks (N) from the groups of interest have been registered.

$$F_n = 56/210 = 0.27.$$

Kursk region

Based on the study conducted on nosologies of the Kursk region, five groups of the most frequent disorders of the body systems were identified among the adult population, three of which were represented in the list of required drugs:

- Respiratory system;
- Musculoskeletal system; and
- Urinary system and sex hormones

$$F_b = 3/9 = 0.33.$$

$F_c = Ba/Bb$, where Ba is 75 dosage forms among the drugs with 43 trade names, and Bb is 1,082 names, which are the total number registered in the state register of trade names.

$$F_c = 75/1,082 \cdot 100\% = 0.07.$$

$F_s = S/Ca$, where S is the number of items in demand (43), Ca is the saturation of the product mix (75).

$$F_s = 43/75 = 0.57.$$

$F_n = N/Ba$, where N is eight new registered trade names from the studied groups for 2018, Ba is 75 of the represented forms in total.

$$F_n = 8/75 = 0.1.$$

Oryol region

The most common nosologies in the region have been associated with the following disorders of the body systems:

- Respiratory;
- Digestive; and
- Systemic anti-microbial preparations.

The product mix of drugs in the regional pharmacies was represented in the highest degree by three groups from the list of required drugs.

$$(Ba):F_b = 3/9 = 0.33.$$

The product mix of drugs in demand in the region was represented by 155 registered trade names (Ba) in various dosage forms. A total of 1,082 trade names (Bb) with corresponding dosage forms from these groups of the required drugs were in the state register.

$$F_c = 155/1,082 = 0.14.$$

128 commodity units were in stable demand in the regional pharmacies. The actual saturation of the product mix was 155.

$$F_s = 128/155 = 0.82.$$

Over the course of the study, 24 new trademarks (N) from the groups of interest were registered.

$$F_n = 24/155 = 0.15.$$

Tula region

Due to the nosologies of the region, the product mix in pharmacies should be represented in the highest degree by the four groups of the required drugs (Ba):

- Respiratory;
- Cardiovascular;
- Musculoskeletal system; and
- Systemic anti-microbial preparations.

$$F_b = 4/9 = 0.44.$$

The range of drugs in demand in the region was represented by 219 registered trade names (Ba) in various dosage forms. A total of 1,082 trade names (Bb) with corresponding dosage forms from these groups of the required drugs were in the state register.

$$F_c = 219/1082 = 0.2.$$

114 commodity units were in stable demand in the regional pharmacies. The actual saturation of the product mix was 219.

$$F_s = 114/219 = 0.52.$$

Over the course of the study, 36 new trademarks (N) from the groups of interest were registered.

$$F_n = 36/219 = 0.16.$$

The generalized product mix characteristics of the required drugs in four regions of the CFD have been presented in Table 1.

Table 1: Product mix characteristics of the required drugs.

Indicator	Region			
	Bryansk	Kursk	Oryol	Tula
Factor of breadth	0.55	0.33	0.33	0.44
Factor of completeness	0.19	0.07	0.14	0.2
Factor of stability	0.66	0.57	0.82	0.52
Factor of novelty	0.27	0.1	0.15	0.16

The weighting factors should be found for each indicator to determine the rationality factor. The expert method was used to do this.

The weighting factor of the product mix indicators can be defined using the method of a fixed amount, which was as follows. Experts assigned a weighting factor for each indicator of the product mix, taking their significance into account so that the sum was 1.

The weighting factor of the indicators was calculated according to the following formula:

$$g_i = \sum^n m \times l / \sum_{i=1}^n \sum_{i=1}^r m_i \times l,$$

where g_i is the weighting factor;

$m_i \times l$ is the value assigned to the property;

n is the number of experts; and
r is the number of properties.

The consumers from the relevant areas visiting the pharmacy at the time of the study were experts. Each of the selected consumers was asked to rate the importance of each of the given indicators of the product mix (completeness, breadth, stability, and novelty) when choosing the required drug. The research data and the calculation of all weighting factors separately for each of them have been presented in Tables 2-5.

Table 2: Weighting factors of indicators of the Bryansk region.

Product mix indicator	Expert				Sum
	1	2	3	4	
Breadth	3	3	4	3	13
Completeness	4	4	2	4	14
Stability	2	1	1	2	6
Novelty	1	2	3	1	7
Total					40

The following data were obtained as a result of calculating the weighting factors:

1. W_b (weight of breadth) = $13/40 = 0.325$;
2. W_c (weight of completeness) = $14/40 = 0.35$;
3. W_n (weight of novelty) = $7/40 = 0.175$;
4. W_s (weight of stability) = $6/40 = 0.15$.

Table 3: Weighting factors of indicators of the Kursk region.

Product mix indicator	Expert				Sum
	1	2	3	4	
Breadth	3	1	2	2	8
Completeness	1	3	1	1	6
Stability	4	4	4	3	15
Novelty	2	2	3	4	11
Total					40

$g_i = 8/40 = 0.2 - F_{wb}$;
 $g_i = 6/40 = 0.15 - F_{wc}$;
 $g_i = 15/40 = 0.375 - F_{ws}$;
 $g_i = 11/40 = 0.275 - F_{wn}$.

Table 4: Weighting factors of indicators of the Oryol region.

Product mix indicator	Expert				Sum
	1	2	3	4	
Breadth	2	3	4	4	13
Completeness	4	2	3	2	11
Stability	3	4	2	1	10
Novelty	1	1	1	3	6
Total					40

$g_i = 11/40 = 0.275 - F_{wc}$;
 $g_i = 13/40 = 0.325 - F_{wb}$;

$g_i = 10/40 = 0.25 - F_{ws}$;
 $g_i = 6/40 = 0.15 - F_{wn}$.

Table 5: Weighting factors of indicators of the Tula region.

Product mix indicator	Expert				Sum
	1	2	3	4	
Breadth	3	1	2	3	10
Completeness	4	3	4	3	14
Stability	2	4	1	1	8
Novelty	1	2	3	2	8
Total					40

$g_i = 14/40 = 0.35 - F_{wb}$;
 $g_i = 10/40 = 0.25 - F_{wc}$;
 $g_i = 8/40 = 0.2 - F_{ws}$;
 $g_i = 8/40 = 0.2 - F_{wn}$.

Then, the rationality factors of the required drugs for each region were found (Table 6).

Table 6: Rationality factors of the required drugs.

Region	Calculation of the rationality factor
Bryansk	$Fr = 0.55 \times 0.325 + 0.194 \times 0.35 + 0.662 \times 0.15 + 0.27 \times 0.175 = 0.175 = 0.4$
Kursk	$Fr = 0.33 \times 0.15 + 0.0693 \times 0.2 + 0.57 \times 0.375 + 0.275 \times 0.175 = 0.106 = 0.3$
Oryol	$Fr = 0.33 \times 0.275 + 0.14 \times 0.325 + 0.82 \times 0.25 + 0.15 \times 0.175 = 0.09 + 0.045 + 0.205 + 0.023 = 0.36$
Tula	$Fr = 0.44 \times 0.25 + 0.2 \times 0.35 + 0.52 \times 0.2 + 0.16 \times 0.2 = 0.11 + 0.07 + 0.1 + 0.03 = 0.31$

The data of Rosstat and the results obtained at the first stage of the study allowed to logically proceed to the next stage (Table 7).^[15-17]

Since diseases of the respiratory system have been the most common nosology in the regions under analysis, the authors conducted a marketing analysis of the list of VEM for the treatment of diseases of the respiratory system by the following two parameters:

- determination of the import substitution indicator;
- ranking by price range.

Table 7: Indicators of morbidity structure of the population in four regions of the CFD by main classes of diseases (%)

Diseases	Regions			
	Oryol	Kursk	Tula	Bryansk
All diseases	100	100	100	100

some infectious and parasitic diseases	4.0	3.6	3.4	3.31
neoplasms	3.7	1.47	2.6	1.46
diseases of the blood, blood-forming organs and certain disorders involving the immune mechanism	0.16	0.61	0.21	0.35
endocrine, nutritional and metabolic diseases	1.85	1.7	1.69	2.1
diseases of the nervous system	1.94	1.98	1.69	1.74
diseases of eyes and their adnexa	8.7	4.3	8.0	4.2
diseases of ears and mastoid process	3.56	3.42	6.2	3.41
diseases of the circulatory system	8.87	4.0	7.3	3.95
respiratory diseases	37.69	43.4	31.3	40.98
diseases of the digestive system	5.04	4.53	2.74	7.85
diseases of the skin and subcutaneous tissue	6.11	5.65	8.5	5.71
diseases of the musculoskeletal system and connective tissues	3.65	3.87	5.7	3.22
diseases of the genitourinary system	9.2	5.96	8.2	4.75
complications of pregnancy, childbirth and the postpartum period	2.7	2.3		
congenital anomalies (malformations), deformities and chromosomal abnormalities	0.31	0.26	0.55	0.22
injuries, poisoning and some other effects of external causes	12.93	11.6	11.9	12.57

Definition of the import substitution indicator

It was found during the systematization of the product mix by manufacturers that the domestic drugs made up 43.5 % of the total amount of drugs for treating diseases of the respiratory system, and the foreign drugs made up 56.5 % (113 trade names).^[18] This means there was a minimum gap, as the foreign production prevailed only by 13 %.

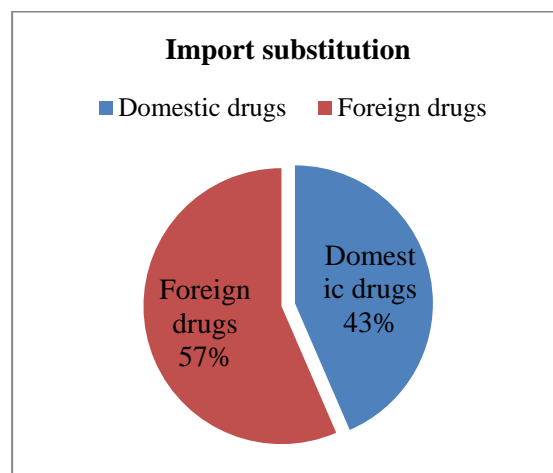


Figure 1: Ratio of foreign and domestic drugs.

Ranking by the price range

The authors determined the availability of drugs in the group under study by belonging to a certain price range.^[13] Structuring and finding the number of drugs in each price range have been presented in Table 8:

Price (rub.)	Dosage forms (count)	%
<50	149	24.8
50 – 100	137	22.8
100 – 500	210	34.9
500 – 1,000	45	7.5
>1,000	61	10.1

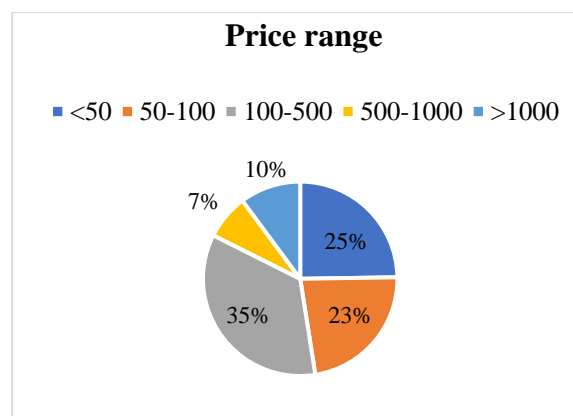


Figure 2: Ratio of dosage forms in different price ranges.

It followed from here that most of the dosage forms were drugs in the price range of 100–500 rubles, less than 50 rubles, and 50–100 rubles. There was a small number of relatively expensive drugs, from 500 rubles and higher.

Results

The following results have been obtained after the data analysis:

1. The most pronounced indicator for visitors to pharmacies in the Bryansk and Tula regions was

- "completeness"; it indicated that the customers' needs in purchasing various forms of a single drug were fully met.
- The "product mix breadth", along with "completeness", was a pronounced indicator for visitors to pharmacies in the Bryansk and Oryol regions, as it allowed customers purchasing various drugs according to their needs and preferences.
 - The most significant indicator for visitors to pharmacies in the Kursk region was the "stability of the product mix", which allowed meeting the demand of customers for the same drugs.
 - Visitors to pharmacy organizations of all regions participating in the study found "novelty" to be the least pronounced indicator of the product mix. In other words, the availability of new drugs in the pharmaceutical market did not seem to be significant.
 - The analysis of the results of calculating the "rationality factor" for four regions of the Federation of the CFD revealed that the highest value of the rationality factor was obtained in the Bryansk region (0.4). The lowest value of the "rationality factor" was 0.31 in the Kursk region.
 - The results of the ranking of the VEM list for the treatment of diseases of the respiratory system were as follows: the imported drugs prevailed by 13%; the drugs up to 500 rubles made up 83%, and those over 500 rubles made up 17%.

Discussion

The results of the study confirmed the hypothesis on the improvement of the list of required drugs put forward by the authors, as well as the adoption of the regionally required drugs at the level of regions in accordance with the structure of their diseases, rather than in Russia as a whole. It has been suggested to find the "rationality ratio" for the required drugs in each region in order to improve the physical accessibility of outpatient medical care. It must be noted that the introduction of blockchain technology in the state regulation of the socially significant pharmaceutical market opened up new opportunities, both for regions and their end consumers.^[19] To approximate the list of required drugs to a rational minimum product mix, it must be revised as necessary, i.e., when new drugs emerged on the market and the less effective ones were quitted. It must also be noted that the improvement of drug supply in Russia in the near future would be associated with the development of the National Institute of Drug Interchangeability, operation of the Common Market of Drugs of the Eurasian Economic Union, as well as the development strategy for the Russian pharmaceutical industry "Pharma 2030".^[20-24]

Findings

- The analysis of correspondence of indications of drugs from the list of required drugs for medical use to the existing morbidity structure in four regions (Bryansk, Kursk, Oryol and Tula) has revealed that there were no corresponding product mix positions included in

- the list of the required drugs for the treatment of two of the five main classes of diseases in the Kursk region.
- Due to the fact that the maximum value of the rationality factor should be equal to 1, the results of the study proved that the product mix of the required drugs in none of the four areas participating in the study was not rational (below 50%).
 - Due to the leading position of respiratory diseases in all the regions under study, the VEM list must be adjusted to include relevant modern and effective drugs of domestic production.
 - Due to the fact that 17% of the drugs for the treatment of respiratory diseases from the VEM list cost over 500 and 1,000 rubles, they were less accessible to the public.

Conclusions

The results of the study allowed to argue that techniques to optimize the structure of the product mix matrix for the required drugs should be developed and implemented in order to improve the quality and accessibility of the drug supply in the outpatient segment of medical care. The VEM list must be timely updated in accordance with the actual needs of the population by introducing the latest drugs to the market and implementing drug insurance programs. The list of the required drugs in the pharmacy secured the priority needs of healthcare in the outpatient segment in order to prevent and treat the diseases prevailing in the structure of morbidity in the Russian Federation as a whole. Due to this, the regional marketing analysis of the required drugs has been an important aspect of the activity, which allowed giving an objective assessment of the work of the executive power and the subject of the retail segment of the drug circulation on forming a rational and patient-oriented list of the required drugs in the pharmacy.

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