

# Study of Regional Factors Influencing the Consumer Demand for Medicinal Drugs for Outpatient Treatment of Patients with Community-Acquired Pneumonia

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## ABSTRACT

**Background:** Drug therapy of patients with community-acquired pneumonia is associated with the use of a wide nomenclature of drugs of various pharmacotherapeutic groups, including modern expensive drugs.

In order to develop sound managerial decisions for the heads of pharmacy organizations on the optimal drug provision for patients with community-acquired pneumonia undergoing treatment in outpatient conditions, it is necessary to have reliable data on the medical and demographic status of patients exposed to community-acquired pneumonia, as well as on factors influencing the choice of medicinal drugs by patients during responsible self-treatment.

**Objective:** The objective of the study was to conduct a sociological study to determine a medical-demographic portrait of a patient with community-acquired pneumonia receiving outpatient care and to analyze a complex of factors influencing the choice of necessary medicinal drugs.

**Methods:** The following methods have been used as a scientific analysis tool: content analysis of statistical documents, special medical and pharmaceutical literature; sociological survey in the form of face-to-face anonymous patient questionnaires; grouping and comparison of the obtained results.

**Findings:** Based on the results of a sociological survey, a regional medical and demographic portrait of a patient with community-acquired pneumonia has been drawn up. This is a man, aged 46 to 55 years. He is a city resident with secondary special education, living in satisfactory housing conditions, has a permanent job and a monthly average per capita income per family member in the amount of 8 to 13 thousand rubles, while he is ready to spend no more than 20% of his

income on necessary medicines. No more than 2 times a year he suffers from respiratory diseases, is prone to responsible self-treatment, as the medical care is sought only for urgent indications. Factors determining the consumer demand for medicines have been identified. The crucial factor in choosing a pharmacy to purchase the necessary medicinal drugs is its flexible pricing policy, and when choosing drugs from the proposed product range of similar products - their price.

**Conclusions:** It has been established that the case rate of community-acquired pneumonia in the territory of the Kabardino-Balkarian Republic is characterized by a certain medical-demographic portrait of an average patient, the peculiarities of which should be taken into account when organizing medical provision of the population of the Republic. Factors forming consumer demand for medicinal drugs necessary for pharmacotherapy of community-acquired pneumonia, connected with social and economic level of development of the region have been defined.

**Keywords:** community-acquired pneumonia, patients, case rate, questionnaire survey, factors, medicinal drugs

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## INTRODUCTION

For many years, pneumonia, including community-acquired pneumonia (CAP), has been one of the most common infections worldwide. There are about 450 million pneumonia cases worldwide every year [1, p. 3]. Researchers indicate that CAP remains one of the leading causes of death - about 4 million deaths per year, or about 7% of all reported cases. In recent years there has been an increase in the incidence of this pathology, with health professionals suggesting that this trend will continue in the future [2].

The medical and social consequences of the CAP are associated with an annual increase in the death and disability of patients, an increase in the risk of spreading the disease among children and older persons (over 65 years of

age), significant financial costs for treatment and the management of the severe consequences of the disease. The treatment of CAP is carried out depending on the severity of the disease under inpatient or outpatient conditions [3, pp. 186-187]. For the treatment of CAP under inpatient and outpatient conditions, in accordance with the standards of medical care and clinical recommendations of the Ministry of Health of the Russian Federation, 18 international generic names of medicinal drugs are used, including those belonging to expensive ones, included in the price range from 1000 to 3000 rubles per one conventional package [4, p. 132]. Therefore, the heads of pharmacy organizations have an important task to fully satisfy the consumer demand for these medicinal drugs. This task should be solved by

means of scientifically grounded management of drug assortment based on medico-demographic portrait of an average patient with CAP and analysis of factors forming consumer demand. The successful solution of this important socio-economic problem ensures the safety of pharmaceutical services provided to patients and the population by pharmacies [5, p. 26].

Based on the above, the objective of the study was to conduct a sociological study to determine a medical and demographic portrait of a patient with community-acquired pneumonia receiving outpatient care and to analyze a complex of factors influencing the choice of necessary medications.

### LITERATURE REVIEW

Despite the increased interest on the part of the world and domestic medical science and practice to overcome the problems with the growth of case rate of CAP, studies related to the management of drug range in the therapeutic treatment of this pathology under outpatient conditions, taking into account territorial (regional) medical-

demographic and socio-economic conditions have not been revealed, which confirms the relevance of this study.

### METHODS

The method of sociological survey in the form of face-to-face anonymous questionnaires of patients was chosen as the main instrument of scientific analysis for the purpose of our research [6, p. 67].

In order to prepare an array of data required to form a medical-demographic portrait of an average CAP patient, a survey questionnaire was developed consisting of 12 questions, grouped into 3 blocks. Block 1 includes demographic, block 2 includes socio-economic and block 3 includes medical and pharmaceutical questions reflecting both the personal characteristics of patients and a number of factors affecting the choice of medicinal drugs for treatment of CAP under outpatient and inpatient conditions. For each question there were prepared answer formats, which the respondent had to choose during the questionnaire (Table 1).

Table 1: Questionnaire list and questionnaire format for forming a medical-demographic portrait of a patient with community-acquired pneumonia

Question No.	Question text	Question format (mark the necessary meaning)
<i>Block No. 1 – Demographic questions</i>		
1.1	Please indicate your sex	- male - female
1.2	Please indicate your age (full years)	- under 25 years of age inclusive - 26 to 35 - 36 to 45 - 46 to 55 - 56 to 65 - 66 or more
1.3	Where do you reside?	- in the city - in the village
1.4	What education do you have?	- secondary - special secondary - higher
<i>Block No. 2 – Social and economic questions</i>		
2.1	What are your living conditions?	- good - satisfactory
2.2	Do you have a permanent job or other permanent source of income?	- I do - I don't
2.3	What is your monthly average per capita income, including your family members?	- up to 8 thousand rubles - between 8 thousand and 13 thousand rubles - between 13 thousand and 20 thousand rubles - over 20 thousand rubles
2.4	What proportion of your average per capita income can you spend monthly to purchase the necessary medicinal drugs?	- not more than 10% - not more than 20% - not more than 30% - as much as necessary
<i>Block No. 3 – Medical and pharmaceutical questions</i>		

3.1	How often do you suffer from respiratory diseases?	- 3 times a year and more - not more than two times a year - not more than once every two to three years
3.2	How often do you seek medical help due to respiratory diseases?	- never address - address only in urgent cases - always address
3.3	What factor is crucial when choosing a pharmacy to purchase a medicinal drug?	- convenient location - wide product range - flexible pricing - pharmacy employees professionalism
3.4	What influences your choice when purchasing the required medicinal drug?	- pharmacy employees recommendations - acquaintances' recommendations - personal experience - price

The Kabardino-Balkarian Republic, an entity that is part of the North Caucasus Federal District, was chosen as an experimental region of the Russian Federation. Direct research to identify a medical-demographic portrait of a patient with CAP and to analyze socio-economic and medical-pharmaceutical factors affecting the choice of medicinal drugs for treatment of CAP under outpatient conditions was carried out on the basis of therapeutic departments of state budgetary health care institutions City Polyclinic No. 1 and City Polyclinic No. 3 located in the capital city of Nalchik, The Kabardino-Balkarian Republic.

## RESULTS

Content analysis of medical scientific literature has shown that the largest number of cases of CAP incidence falls on winter and spring months [3, p. 186], so the study was conducted from February to June 2018.

According to official statistics, the case rate of CAP in Russia for the period 2010-2017 increased from 19778 to 21639 cases per 100 thousand people, and in 2018 amounted to more than 22000 cases [7, page 214].

On the territory of the the Kabardino-Balkarian Republic the CAP case rate has been growing more rapidly - from 9049 in 2013 to 13581 cases per 100 thousand people in 2018. [8, c. 63]. This situation was the reason for the fact that the the Kabardino-Balkarian Republic territory was chosen to conduct a model study according to the set objective.

According to modern data, in more than half of the cases of CAP patients can receive medical care under outpatient conditions. This situation applies mainly to patients in the 14-60 age group for mild forms of disease [2, p. 8].

In order to ensure the representativeness of the data of the sociological survey, the number of respondents was determined by the formula of a nonrepeating selection (1) [9, p. 13]:

$$n = \frac{Nt^2 pq}{\Delta^2 N + t^2 pq}$$

(1)

where:  $n$  - the number of the sample population;  $N$  - the number of the general population, in our study this is the number of patients with the diagnosis of CAP treated under outpatient conditions under the control of doctors-pulmonologists in the city clinics No. 1 and No.3 of Nalchik for the period from February to June 2018. The total number of such patients was 88 people;

$t$  - confidence coefficient, depending on the probability with which the accuracy of the sample is guaranteed, with the probability of error-free sign  $P = 0.95$ ,  $t = 2$ ;

$p$  - fraction of the studied feature, in our study this value is an undefined value and therefore its maximum value  $p = 0.5$  is applied;

$q$  - the value of the indicator is calculated from the ratio  $q = (1 - p)$  and since the value of  $p = 0.5$ , the unknown maximum value of the product  $pq = 0.25$ ;

$\Delta$  - the error limit of the sample fraction, which in our case is  $\Delta = 0,05$ .

By substituting all numeric values for formula (1), we obtained:

$$n = \frac{88 \times 2^2 \times 0,25}{0,05^2 \times 88 + 2^2 \times 0,25} = 72,13$$

Thus, to ensure the representativeness of the study it was necessary to obtain 72 questionnaires of patients with CAP who were treated under outpatient conditions under the supervision of physician-pulmonologists of two polyclinics of the city of Nalchik.

The survey on the questionnaires developed by us was conducted by the doctors of therapeutic departments when the patients visited the polyclinics after recovery in order to draw up the sheets of temporary disability, receive medical and other recommendations from the attending physicians. After all the questionnaires were collected and checked, the data were summarized. The Microsoft Excel spreadsheet editor (Table 2) was used to analyze the data array.

Table 2: The results of the processing of an array of survey data on patients with community-acquired pneumonia

Question No.	Answer format	Amount of chosen options	% share of chosen options
<i>Block No. 1 – Demographic questions</i>			
1.1	- male	41	56.8
	- female	31	43.2
1.2	- under 25 years of age inclusive	6	8.3
	- 26 to 35	10	13.8
	- 36 to 45	10	13.8
	- 46 to 55	18	25.2
	- 56 to 65	15	20.8
	- 66 or more	13	18.1
1.3	- in the city	47	65.2
	- in the village	25	34.8
1.4	- secondary	18	25.0
	- special secondary	35	48.6
	- higher	19	26.4
<i>Block No. 2 – Social and economic questions</i>			
2.1	- good	31	43.1
	- satisfactory	41	56.9
2.2	- I do	65	90.2
	- I don't	7	9.8
2.3	- up to 8 thousand rubles	8	11.1
	- between 8 thousand and 13 thousand rubles	44	61.1
	- between 13 thousand and 20 thousand rubles	15	20.8
	- over 20 thousand rubles	5	7.0
2.4	- not more than 10%	17	23.6
	- not more than 20%	35	48.6
	- not more than 30%	14	19.4
	- as much as necessary	6	8.4
<i>Block No. 3 – Medical and pharmaceutical questions</i>			
3.1	- 3 times a year and more	12	16.6
	- not more than two times a year	40	55.5
	- not more than once every two to three years	20	27.9
3.2	- never address	23	31.9
	- address only in urgent cases	33	45.8
	- always address	16	22.3
3.3	- convenient location	13	18.0
	- wide product range	4	5.5
	- flexible pricing	48	66.6
3.4	- pharmacy employees professionalism	7	9.9
	- pharmacy employees recommendations	15	21.0
	- acquaintances' recommendations	10	13.8
	- personal experience	8	11.1
	- price	39	54.1

Thus, the necessary results were obtained, which served for the formation of the medical-demographic portrait of patients with CAP and formed the basis for the analysis of

the factors influencing their consumer demand by the nomenclature of necessary medicinal drugs.

## DISCUSSION

Analysis of respondents' answers to demographic questions in the survey (Block 1) showed that the average CAP patient in the Kabardino-Balkarian Republic territory is a man (58.2% of all respondents), aged 46-55 years (25.2%), living in an urban area (65.2%), with secondary special education (48.6%).

Based on the analysis of answers to socio-economic questions (Block 2), it was found that the average CAP patient lives in satisfactory living conditions (56.9%), has a permanent job or other source of income (90.2%) and has a monthly average per capita income per family member from 8 to 13 thousand rubles (61.1%). At the same time, he is ready to spend no more than 20% of his average income per capita (48.6%) per month on the purchase of necessary medicinal drugs.

The data of the survey on the group of medical and pharmaceutical questions revealed that the average patient regularly, but not more than 2 times a year suffers from respiratory diseases (55.5%), and is prone to responsible self-treatment, as he seeks medical care only on urgent indications (45.8%). In the course of self-treatment, the patient has to purchase the necessary medications on his own. In this case such factors as flexible pricing policy (66.6%) influence the patient's choice of a pharmacy. Their price (54.1%) is decisive for the average patient when choosing the necessary medicinal drugs from the offered product range.

The results of a representative sociological study revealed several factors influencing the consumer demand of CAP patients during treatment under outpatient conditions. These factors are characteristic of the system of drug supply to the population of the Kabardino-Balkarian Republic, which operates in complex regional socio-economic conditions. Thus, according to the "Rating of socio-economic status of the constituent entities of the Russian Federation for 2018" the Kabardino-Balkarian Republic ranks 77th out of 85 subjects of the Russian Federation [10, p. 29]. In this connection, there is a connection between the level of patients' income and a number of its behavioral characteristics.

Flexible pricing policy of a pharmacy (availability of discount schemes, benefits, and other free services) is, according to the results of the survey, a determining factor in choosing a pharmacy. Almost all patients with low income are primarily focused on the level of retail prices for medicinal drugs, while other factors play an insignificant role in choosing a pharmacy.

In addition, it was found that the orientation of CAP patients in choosing the necessary medicinal drugs, in addition to their price, is based on the recommendations of the attending physicians of medical organizations and pharmaceutical workers of pharmacies, therefore, effective information work with citizens seeking medical and drug assistance should be in the focus of attention of all health professionals.

## CONCLUSION

As a result of the study it was found that the case rate of CAP in the territory of the Kabardino-Balkarian Republic

forms a certain medical-demographic portrait of an average patient, whose features should be taken into account in the organization of medical care for the population living in this entity of the Russian Federation. Factors forming consumer demand for medicinal drugs, necessary for CAP pharmacotherapy, related to the socio-economic level of the region's development, have been revealed. The data obtained are essential for the optimal management of drug supply for CAP patients receiving medical care under outpatient conditions.

## FUNDING

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