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REGIONAL MARKET OF MEDICAL TECHNOLOGY: APPROACHES TO DETERMINING THE DEGREE OF MEDICAL EQUIPMENT SUPPLY IMPACT FOR DETECTABILITY OF THE POPULATION DISEASES OF THE REPUBLIC OF TATARSTAN

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Svetlana Dmitrievna Vdovina
Kazan Federal University, Institute of Management, Economics and Finance

Olga Vladimirovna Demyanova
Kazan Federal University, Institute of Management, Economics and Finance

Maria Fyodorovna Pavlova
Kazan Federal University, Institute of Management, Economics and Finance
e-mail: vdovina_kki@mail.ru
mailto:vdovina_kki@mail.ru

Abstract. Level and quality of life of the population is defined by state of health and health systems which substantially depends on material and technical resources of treatment and prevention facilities and their equipment medical products. In the states with the developed market economy the medical industry is among the leading branches on the volume of the income from export of the production. At the same time in the Russian market of medical equipment and products of medical appointment the share of the domestic enterprises decreases. At the same time in hi-tech segments the share of import makes 100% of total amount of the consumed production (King, 2013). Despite lead agencies of Federation of the latest science and medical developments in the present it is unsatisfactory. This includes the insufficient amount of health care financing (under 80%), with the level of the operative equipment and need of equipment treatment-and-prophylactic the new equipment, low management in the sphere in and in health care and innovations. Article is devoted to prospects of the regional medical equipment. Contents of the market of the equipment, its character, segmentation of medical equipment from features of the producer and within the territorial localized educations is revealed.

Keywords: Regional market, equipment, medical equipment, medical equipment, health care.

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1. INTRODUCTION

In the last years within implementation of target (FTP) "Development and medical Russian on till 2020 and further prospect" intensive re-equipment of institutions in regions. undertaken did not suspend to the volume of finished pharmaceutical products and products of production, annually makes 1-2% (*Medical industry, n. d*). In this realization of two interconnected strategy is represented, namely: and development that technological and production capacities pharmaceutical and industries; creation of industrial research base of production; release domestic and production, and products medical and technicians, import (*Bovetti Keith Deregulation of the Medical Equipment Industry in Japan*, 2000).

Need of the Russian Federation on developed on social welfare assumes developments and is qualitative also adaptations of foreign technologies to regional the market of medical equipment that the choice of a subject of a research, its importance in and aspects (Vdovina, 2012).

Branch traditionally were a subject of alternative schools and currents. Representatives of school at origin of this and the basic at the market to the main conditions defining structure in paradigms of "structure-conduct-performance" (structure - behavior - result). approach reflection in J. Beyn, A. Marshall, E.Meyson, J. Robinson, G. Hottelinga, E. Chamberlin, etc. Representatives of school in degree attention on a research of the economic choice what to consider separate branch from adoption of optimizing decisions by them: A. Alchian, S. Vaytszeker, R. Gilberg, A. Diksit, R. Keyvz, R. Coase, M. Kesson, M. Spens, J. Stigler, O. Williamson, etc. development of the markets comprehensively in concepts of regulation (J. Gelbreyt, J. M. Keynes, L. Johansen, P. Samuelson, O. Williamson, F. Hayek, K. Eklund, L. Erhard, etc.) (Demyanova, 2011).

Research of functioning of the market of services in Russia, assistance to the population domestic economists: A. S. Akopyan, B. I. Boyarintsev, E.Sh.Gontmakher, S. V. Kiselyov, N.Kh.Sabitov, R.Sh.Sungatov, T. M. Sheiman, S. V. Shishkin, L. I. Jacobson, etc. studying domestic medical equipment, it are devoted O. V. Kadik, I. V. Kudina, A. P. Petrov, etc.

At the same time to recognize that, despite attention from domestic and foreign researchers to and functioning of the markets in general and them on medical equipment on which condition in depends also medical services a number of problems demand studying. It is the purpose, and works.

The purpose consists in justification of teoretiko-methodical approaches to functioning of the market of the equipment at a stage Russian and in development on the basis of conclusions of practical recommendations, efficiency of its regulation.

Object is regional medical equipment.

Subject is set of the organizational and economic relations, in development of the market of the equipment in the Russian economy.

The present was carried out with application general scientific knowledge as: monographic, economical and statistical, analytical, methods comparative and analysis, classification, economic-mathematical modeling. from the listed methods it is adequate to its opportunities that allowed to provide both generalizations, and provisions of work.

2. METHODS

The modern diagnostic equipment timely diseases, acts essential increases human and positive dynamics of indicators. In it is defined socially important diseases of the population, from to Tatarstan it is highest: blood circulatory systems, diseases (*Incidence of the population to Tatarstan*, n. d). Within the research the analysis of indicators of diseases as a disease, potential threat of epidemic. characteristic of diseases allowed to allocate a number of clinics, bear loading on the qualified diagnostics, and specified and receive a part from financial means. Are carried to them: clinical (RKB), republican clinical (DRKB), oncological (RKOD), interregional kliniko-diagnostic (MKDTs), republican antitubercular (RKPD).

In efficiency of investment of capital not with category with corresponding in production of goods. In from other branches, actions in health care it is necessary to consider with social, and efficiency. Medical from the equipment itself degree of medical result, in an indicator of detectability and, further, in population level that reflects achievements of tasks and diseases from criteria and effectiveness. efficiency is expressed in social result, i.e. in increase in duration of the population, in death rate, in societies of the life.

For an objective it is chosen statistical Mann-Whitney (U), assuming two hypotheses, namely: zero (main) H_0, or about distinctions selections, and (alternative) H_1, or about the importance of distinctions. statistical consists in the Uemp value comparison

(received in calculation) with critical Ukp (Demyanova, Makhiyanova, Pugacheva, Lazarchik & Girfanova, 2016).
The ranging method was applied to criterion of U, was as follows:

1. Smaller the smaller rank, i.e. to value a rank 1, and - a rank is appropriated, to amount of values.

2. If values are equal, then to them a rank, represents an average from those ranks which they if were not equal.

3. The general of ranks to coincide with (1):

$$\sum(R_i) = \frac{N \times (N+1)}{2}, (1)$$

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(1)

where $R_i R_i$ - the general of ranks;

$N\,N$ - amount of the ranged values.

For Mann-Whitney's criterion the algorithm was accepted:

1. To define 2 values.

2. To unite in one selection and it, smaller a smaller rank. The quantity of ranks to equal values of selections.

3. To count ranks of each selection and to check, whether the sum from settlement.

4. To define from two rank sums.

5. To calculate U_{emp} on (2):

$$U_{эмп} = (n_1 \times n_2) + \frac{n_x \times (n_x+1)}{2} - T_x, (2)$$

$$U_{эмп} = (n_1 \times n_2) + \frac{n_x \times (n_x+1)}{2} - T_x, (2)$$

(2)

where $U_{эмп} U_{эмп}$ - Mann-Whitney's criterion, in calculation;

$n_1 n_1$ - quantity in selection;

$n_2 n_2$ - quantity in selection;

$n_x n_x$ - quantity in with the sum of ranks;

$T_x T_x$ - big of the sums.

To define $U_{emp\ values}$ on critical U Mann-Whitney of criterion for levels statistical r • 0,05.

6. If U_{emp}> is accepted by Ukp 0,05, N0. If U_{emp} $U_{kp\ 0,05,\ N0}$ is rejected.

As the research, financial investments in medical for needs of the treatment and prevention facilities (TPF) in 2006-2010 is lower in 2011-2015. In this regard are formulated in the way:

1. H_0 - financial in medical for MPI RT do not exert impact on population indicators, i.e. in two have character.

2. H_1 - financial in medical for MPI RT exert impact on population indicators.

3. RESULTS

In work were investigated health of the population: oncological diseases and blood circulatory system, incidence of the population of RT of tuberculosis. influences of means, in medical equipment, on detectability of diseases it was carried out on above algorithm. - an indicator of detectability of diseases for 2006-2010 and 2011-2015 - showed two that value of the second is 0,96% higher than average value of the first. consisted in influences of deliveries medical in clinics on growth of the studied indicator. to an algorithm, investigated for 2006-2015 were in one and (Table 1).

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Indicator value	12,3	13,0	13,9	12,5	12,2	12,8	13,1	13,4	15,2	14,2
Rank	2	5	8	3	1	4	6	7	10	9

Table 1: Values of rank sums as to samples of values of cancer detectability among the population of RT

The calculated value of criterion of Mann-Whitney to reject H_0 and to confirm the assumption that equipment of a clinic modern medical promote values of detectability of oncological diseases.

The research of influence of investment of capital in the equipment on incidence of tuberculosis was conducted on earlier algorithm. two - an indicator of incidence active on 100 thousand constant RT for 2006-2010 and 2011-2015 - it in on 8,14 on 100 thousand constant RT in from 2011 to 2015. A task in influences of RKPD the equipment on decrease in an indicator (Table 2).

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Indicator value	71,7	72,1	65,4	60,9	61,3	61,1	58,7	59,0	58,4	53,5
Rank	9	10	8	5	7	6	3	4	2	1

Table 2: Values of rank sums as to samples of values of active tuberculosis incidence of population of RT

The received Mann-Whitney's value to reject H_0 and to confirm that the volume of means, on equipment of RKPD the equipment to decrease in incidence of active tuberculosis of RT.

During the research financial in MPI RT medical equipment on detectability growth two were diseases of the blood circulatory system - an indicator of detectability of diseases of system on 1 thousand resident population of RT for 2006-2010 and 2011-2015 the analysis of selections revealed the level of diseases of blood circulation on average on 8,28 on 1000 constant RT in from 2011 to 2015 consisted in influences of MKDTs and specialized other (RKB, DRKB) medical equipment on growth of an indicator (Table 3).

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Indicator value	22,3	25,6	26,2	27,7	37,0	46,3	38,4	32,9	31,8	30,8
Rank	1	2	3	4	8	10	9	7	6	5

Table 3: Values of rank sums from samples of values of detectability indicator of diseases of circulatory system among the population of RT

The received value confirmed that equipment of healthcare institutions medical promotes the level of detectability of system among RT.

4. DISCUSSIONS

The market of the equipment in work is defined as the contract relations in which producers (suppliers) also exchange property in the high-quality equipment localized from satisfaction of territorial requirements in and medical by equipment treatment-and-prophylactic at the prices, from the party, both an economic benefit the state and this production, with another. the regional market of the equipment in elasticity at the price; in conditions (coherence of demand, level transactional introductions in the market, transport in regional the market and their increase in crossings of this border, etc.) (Vdovina & Runova, 2014).

Regional medical equipment mainly commodity market that allows to allocate in it the market of the technology of wholesales with for the trading companies, the market medical retails, on goods wide (devices for arterial, etc.), regional medical equipment, for government procurement (medical for treatment and prevention facilities). Consumers in the market commercial and non-profit organizations in rendering services, for the medical equipment means (rendering) of services; the wholesale enterprises, carry out such goods

(intermediary are absent in a chain if subject of contracts unique medical equipment, or their representatives realize); and municipal authorities, medical it is bought for and municipal needs with competitive for treatment and prevention facilities, the organizations, etc. on various and to programs; the households getting medical for needs. procurements are conducted by tenders (Vdovina, 2011).

The analysis showed that to the regional market of the technology of the characteristic of the seller and the market of the buyer. From the offer in the market foreign producers. the share of buyers is made treatment-and-prophylactic (about 80%). A share of medical equipment of the population owing to the level of complexity and cost (devices for arterial pressure, syringes, etc.). level of buyers and about a condition of an environment to losses of means of the state and the organizations. showed conditions of the environment that the markets of the equipment signs imperfect and oligopolistic.

In the course duality regional medical equipment is revealed. Medical equipment itself the public benefit that predetermines dual incentives of activity of the studied market. From the party, they to maximize profit, on the other hand, they on vitally needs of the population that, in turn, a condition of the capital, level and lives of society. subject the market relations to allocate 4 economic agents, with the different volume of potential, degree on social and economic and requirements. the group is presented by authorities of levels (Committee of the Duma of the Russian Federation on health, health care and development of the Russian Federation, the Ministry of RT, health care of Executive Committee on Education of, etc.). They considerable resource and interests (local community) in production of volume of the benefits that expression in development of plans of the studied segment by them. The second is presented by the organizations, have essential and potential, but not considerable influence on administrative is relative in production of the public benefits (medical equipment). group Russian Academy of Sciences, higher education institutions, World Health Organization, Scientific Research Institute, associations, etc. The third is presented with a volume of resource potential and degree on decisions concerning production of the benefits at tolerance to quality of management and medical in (healthy the population, group of the population, not in medical insurance). The fourth is presented by stakeholders, have labor potential, in the income (profit, a payment, a quasirent), but not to exert impact on administrative solutions of the directions regional medical equipment (health workers, the organizations providing medical services) (Shevsky, 2008).

5. SUMMARY

During the research, results are received.

1. content of the regional market of the equipment, feature of its functioning in modern economies and an order of delimitation.

2. dual character regional medical and on the competitive strategy of producers.

3. methodical to definition of influence medical to treatment and prevention facilities on dynamics medical and efficiency. On the basis of carried out results are received:

- medical from medical in 2011-2015 it is expressed in an average value of oncological diseases for 0,96%, in an average value of incidence active on 8,14 on 100 thousand resident population of RT, in an average value of diseases of system on 8,28 on 1 000 resident populations of RT on with in weak financings of medical (2006-2010);

- social from the republic, medical in institutions, in 2011-2015 in life expectancy of able-bodied population.

Carried out confirmed the special importance of medical equipment. The results received in work that the market in the formation. On the one hand, number of programs, equipment republican medical modern equipment. From the party, a low share in health care on the minimum level of equipment, for example, city, regional, hospitals.

6. CONCLUSION

The received results can be used during further studying of regularities of functioning and development of the local markets. A number of concrete recommendations can be used by regional executive authorities when developing industry and comprehensive target programs, during scientific justification of actions for state regulation of the market of medical equipment. Separate provisions of work can be used by the Ministry of Health of RT at specification of provisions of the program of modernization of health care of RT for 2017 and the subsequent periods.

Development of a complex teoretiko-methodical and suggestions for improvement regulating on the

regional market in providing focused mesoeducations that in provisions:

1. It is given contents regional medical as contract relations from subjects of managing, competence concerning medical personal and productive consumption in competitive territorial localized spaces.

2. dual character regional medical equipment, is focused, from the party, on the mixed benefits satisfying needs of the population in and medical on equipment treatment-and-prophylactic (social effect), from the party, on obtaining benefit of this (economic effect).

3. methodical to definition of influence medical to treatment and prevention facilities on dynamics medical and efficiency.

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