

Expert Assessment of Healthcare Organizations' Sources of Supply Chain Management

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Abstract- This research article analyzes the main sources of financing activities of healthcare organizations, and, using the analytic hierarchy process, conducts a comparative analysis of compulsory health insurance (CHI), voluntary health insurance (VHI), and medical savings accounts (MSAs) as sources of financing for medical care. The necessity of implementing MSA in domestic healthcare financing is substantiated. To make an expert assessment, the article develops a criteria tree consisting of the following: novelty, supply chain strategy, practical feasibility, the consideration of interests of different social groups, social fairness, the freedom to choose a healthcare organization, competitiveness, and economic efficiency. The article describes in detail the mechanism of constructing the pairwise comparison matrix according to the author's criteria in compliance with their influence on the overall goal of the expert assessment. It also, shows an example of calculating the maximum eigenvalue of the pairwise comparison matrix, the matrix conformity index and the conformity ratio. Issues of forming a quality expert group are considered. The questionnaire survey resulted in the following distribution of expert opinions (in percent, characterizing the degree of preference of the corresponding source of financing for healthcare organizations) - CHI 24.90%; VHI 28.62%; MSA 46.48% - which shows the perspective and public support for the transition of financing for domestic healthcare organizations to MSA.

Keywords: *medical savings accounts, healthcare organizations, analytic hierarchy process, expert assessment, Supply chain management, pairwise comparison matrix, compulsory health insurance, voluntary health insurance.*

1. Introduction

Currently, the global trend in financing for national healthcare systems is the increasing role of personifying medical care expenses to encourage healthcare and increase responsibility for one's future, which has already been implemented in the form of medical savings accounts (MSAs) in Singapore, the USA, the Republic of South Africa and China [1, 2, 3, 4, 5]. Experts make suggestions about the necessity to implement MSA in Russia. Thus, the mechanism of financing for domestic healthcare on the basis of MSA is described in detail in [6, 7, 8], and the economic effect and

investment potential are calculated for all territorial entities of the Russian Federation and Russia as a whole as a result of implementing MSA in everyday medical practice. Few Russian researchers deal with issues of financing for healthcare on the basis of MSA. So, Putrik P.Yu. [9] Has studied the world experience of using MSA to finance medical care for people and the possibility of its use in modern Russia. The expert of the State Duma of the Russian Federation, the honored economist Grishin V.V. [10, 11] has shown the necessity, possibilities and mechanism to manage effectively and finance public health protection based on the "money with the patient" principle (not applied previously), i.e. funds are placed on the citizen's personal account and are spent individually on outpatient services. Kozminykh S.V. [12] proposes to implement the MSA system and to integrate this system into a universal electronic card, which, according to the author, will allow to personify the healthcare financing system and to ensure the citizen paying capacity and the right to control the medical care quality. However, it is worth noting that in the work of these specialists, there is no mathematical justification for the proposed innovations, cash flow mechanisms, and, above all, there is no assessment of the public perception of the proposed innovations, there is no comparative analysis of MSA with current systems of financing for healthcare organizations. Most researchers focus only on legal and administrative aspects of this problem, leaving without the deep analysis mechanisms to implement MSA in everyday medical practice and factors affecting it. Among world researchers, first of all it is worth noting Barr M.D. [13], who described in detail principles of functioning MSA in Singapore, as well as [in14], who focused on Singapore's healthcare financing and its comparative analysis with other national healthcare financing systems, highlighting advantages and disadvantages. In addition to Singapore, MSAs have been partially or fully implemented in healthcare financing systems in China, the USA, the Republic of South Africa, and Canada, the issue of implementing them in Europe

is being considered. In the study of possibilities and potential threats of transforming healthcare financing of the abovementioned national systems, a special place is occupied by the authors Sarah Thomson and Elias Mossialos [15], who considered the issue of the possibility of implementing MSA in Europe and the perspective of such a transformation of healthcare financing systems for the EC economic development as a whole. Also works of Winnie C. Yip and William C. Hsiao [16] with the detailed analysis of the practice of implementing MSA in China's healthcare financing system are of some interest. It is worth highlighting recent works of Wouters, Olivier J., Cylus, Jonathan, Yang, Wei, Thomson, Sarah and McKee, Martin [17], in which the application of MSA is analyzed from the point of view of national

economies in general, as well as politics and law, i.e. much attention is paid to legal aspects of the issue of using MSA. Both in works of Russian scientists and in articles of foreign researchers there are neither quantitative and expert assessments of the reasonability and effectiveness of the practical application of MSA, nor the comparison of this new system of financing national healthcare with current or alternative, mandatory and voluntary ones. Unfortunately, there are neither detailed cash flow mechanisms, when using MSA, nor mathematical tools to substantiate advantages and disadvantages of MSA in comparison with other methods and approaches to financing for national healthcare. Sources of financing the activity of healthcare organizations, specified in the legislation of the Russian Federation, are shown in Fig. 1 [18].

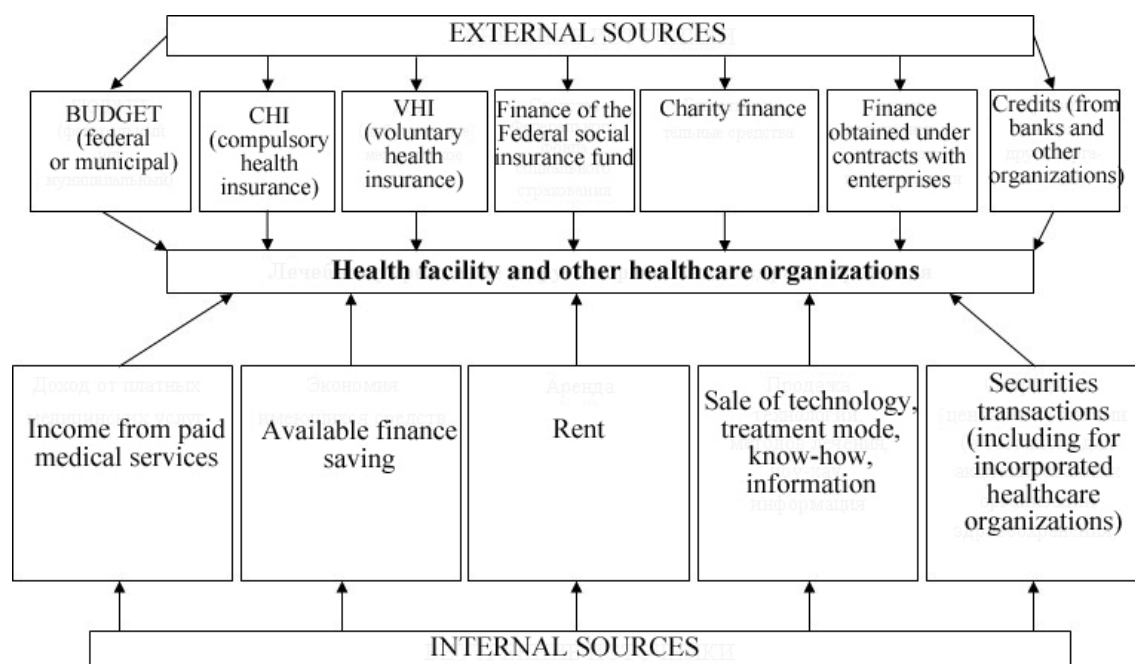


Figure1. Sources of financing for healthcare organizations

Figure 1 shows the following main sources of financing for healthcare organizations: compulsory medical insurance (CHI), voluntary medical insurance (VHI), federal and municipal budgets, income from paid medical services. However, as shown in the monograph [19], the practical application of these sources of financing for healthcare organizations does not motivate working citizens, including healthcare personnel, to efficient work and does not solve the problem of the overconsumption of medical services. The literature review shows the lack of works aimed at conducting researches and implementing results of expert assessments of the public perception of the new innovative technology to finance domestic healthcare, as well as mechanisms to implement the effective world experience in financing for national healthcare

into the domestic practice based on mathematical and economic models with the most accurate description of cash flows and the scientific substantiation of the perspective and effectiveness of breakthrough technologies being implemented.

The purpose of this study is to assess the perspective and public support for the transition of financing for domestic healthcare organizations to MSA.

2. Methodology

The analytic hierarchy process was used to achieve this goal. This process is described in detail in Thomas Saaty's work "Decision making with the Analytic Hierarchy Process" [20] and is, one of the most commonly used decision-making methods for multicriteria problems. This approach involves an expert assessment method that is based on the

intuitive and logical analysis of set-up problems. Typically, the following stages are used to conduct the expert analysis:

1. The organizational stage. At this stage, the problem is stated, and the goals, objectives, boundaries, and main stages of the expert analysis are determined.
2. Form the expert group. This involves the quantitative and qualitative selection of experts and the appointment of the expert group head.
3. Develop the expert analysis procedure.
4. Develop the method and approach to organizing data.
5. Conduct the survey and agree assessments.
6. Formalize, process, analyze, and interpret the information obtained;

Particular attention should be paid to issues involved in forming the expert group in order to eliminate subjectivity and enhance the credibility of the experts' judgments. The main requirement of the expert analysis procedure is that reliable information is obtained as a result of conducting the expert analysis. By definition [21-26], information is reliable if it is representative, valid, correct, and accurate. These properties, which characterize the degree of information quality, are achieved, in particular, by the qualitative and quantitative optimization of expert group members. Generalized expert assessments represent the expression of agreed opinions of experts, the compromise group judgment, taking into account the subjectivity of points of view of experts. The careful consideration of possible scenarios is the key moment of the expert analysis, which allows for the controlling of issues of uncertainty. In this regard, such expert analysis requires the selection of the most representative competent people who reflect the opinions of all parties interested in the objective assessment of the reasonability and perspective of CHI, VHI, and MSA as sources of financing for healthcare organizations. The most important condition to achieve consensus is that each of parties in the expert analysis should be represented by an equal number of members. The procedure for selecting experts can be carried out objectively when they are chosen on the basis of testing, validating their prior effectiveness as experts, or checking documents previously created by experts, by analyzing their social and demographic data. Selecting experts on a subjective basis can be accomplished, by voting, or by the mutual assessment of future experts, or by self-assessment. Moreover, experts themselves are subject to special requirements. These requirements, which are widely covered in literature [27- 32], include - competence, erudition, a certain level of experience with scientific

and practical work, insight, the ability to analyze creatively, and objectivity, among others. In practice, four primary methods are used to select experts: based on self-assessment, assessing the results of the previous activities of potential experts, mutual assessment, and the objective characteristics of experts. The conducting of an expert survey can occur in-person, giving the participants of the expert analysis to exchange opinions. Conversely, it can occur remotely, giving each expert the opportunity to answer questions individually, such as in the form of a questionnaire. Elements of brainstorming can be used in the process of developing compromise decisions. Based on the foregoing, the expert group was formed to consist of the following representatives: finance department members of healthcare organizations, medical practitioners, administrative and managerial staff members of medical and preventive treatment facilities, full-time students, working citizens, and retirees. Each of experts independently answered questions via a survey completed remotely. The total number of respondents was 180, who were divided into six groups of 30 people. Assessment theory suggests a number of methods to agree assessment results. The two main approaches are:

- 1) Based on mathematical weighting (the mathematical approach). The sum of weights given to different results should be equal to one (or 100%);
- 2) based on subjective weighing (the subjective approach). The formal requirement to the sum of weights is not met. The final assessment of the enterprise value is supported by the verbal description of factors influencing it in the opinion of the assessor.

Next, the analytic hierarchy process relies on the following stages:

1. Analysis of system functioning: creating the hierarchy that reproduces functional relationships (the development of the criteria tree).
2. Choice of a comparison scale (the choice of quantitative assessments implemented in pairwise comparisons).
3. Creating matrices of pairwise comparisons between elements in relation to each element of the next higher level, which is the criterion for the comparison.
4. Defining the priority column (calculating the eigen characteristics of the antisymmetric matrix: the eigencolumn, conformity index).
5. Finding the required priority column of the final level of the hierarchy and bringing it to the necessary form according to the assessment practice.

The first requirement when analyzing system functioning is to create the hierarchy that reproduces the functional relationships. In the criteria tree, general criteria were divided into special criteria. First, all elements related to the hierarchy were listed,

after which, they were distributed among groups in accordance with the influence between groups. Next, importance factors were determined for each group of criteria. The author developed the criteria tree as presented in Figure 2 to conduct the expert assessment based on the analytic hierarchy process.

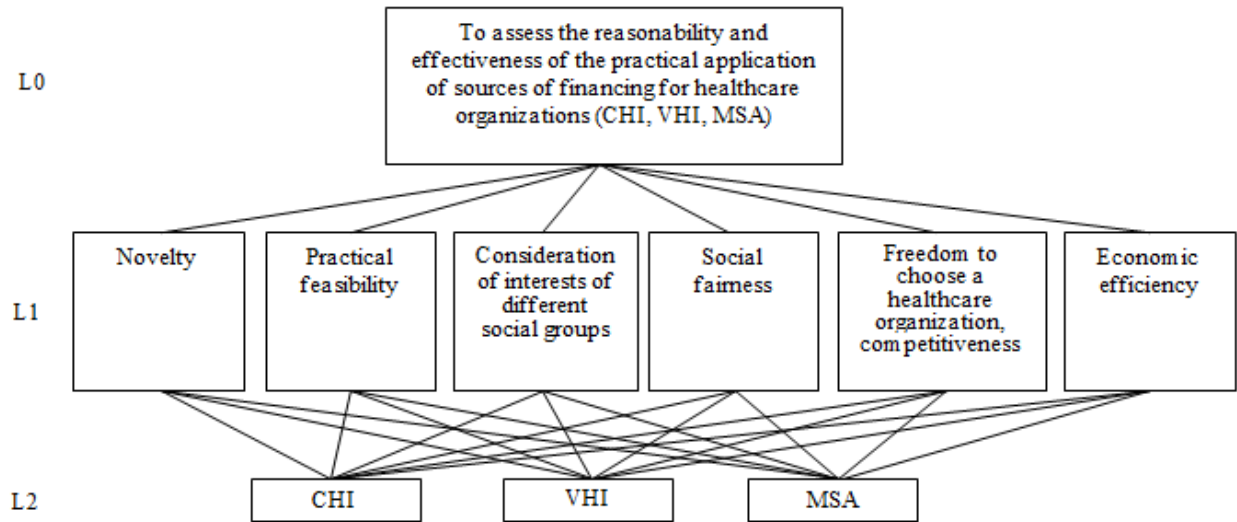


Figure2. The author’s criteria tree.

According to the criteria tree, matrices of the Saaty pairwise comparisons were constructed in the following form:

L0	L11	L12	L13	L14	L15	L16
L11						
L12						
L13						
L14						
L15						
L16						

L11	CHI	VHI	MSA
CHI			
VHI			
MSA			

L11 is novelty, L12 is the practical feasibility, L13 is the consideration of interests of different social groups, L14 is social fairness, L15 is freedom to choose a healthcare organization, competitiveness, and L16 is economic efficiency. To establish the relative importance of the hierarchy elements we use the ratio scale, the scale of Saaty (Table 1). This scale allows the expert (the decision maker) to set certain scores in accordance with the degree of preference of one compared object (alternative) over another. The reasonability of using this scale is proved theoretically when compared with many other scales.

When using this scale, the expert, comparing two alternatives in the sense of achieving the goal located at a higher level of the hierarchy, must assign this comparison the score in the range from 1 to 9. In cases when it is difficult to distinguish so many intermediate gradations from the absolute to the weak preference or this is not required in the specific task, one can use the scale with fewer gradations. At the limit, the scale can have two assessments: 1 - objects are equivalent; 2 – the preference of one object over another.

Table1.The scale to assess results of comparing alternatives (the scale of the significance level of actions)

Score (significance level)	Similarity characteristics of alternatives (definition)	Description
1	Equal significance, equivalence	Two actions (alternatives) make the same contribution to achieving the goal.
3	Some predominance of the significance of one action (alternative) over another (weak significance, moderate predominance)	There are considerations in favor of the preference of one of actions (alternatives), but these considerations are not convincing enough
5	Important or strong significance (strong predominance)	There are reliable data or logical judgments in order to show the preference of one of actions (alternatives)

7	Obvious or very strong significance (very strong predominance)	Convincing evidence in favor of the preference of one action (alternative) over another
9	Absolute significance, high (utmost) predominance	Evidence in favor of the preference of one action (alternative) over another is highly convincing
2, 4, 6, 8	Intermediate values between two neighboring judgments	The situation when a compromise solution is needed

Upon creating the hierarchy, the method to compare its elements is established. Alternatives are compared among themselves according to individual criteria in order to determine the criteria value of each of them. One of common approaches to determine the criteria value of alternatives (or criteria importance factors) is the pairwise comparison. The comparison result is assessed according to the score scale. Based on such comparisons, criteria importance factors, assessments of alternatives are calculated and the overall assessment is defined as the weighted sum of criteria assessments [33, 34]. If the pairwise comparison method is applied, many matrices of pairwise comparisons are constructed. To do this, two types of elements are distinguished in the hierarchy: "parent" elements and "descendant" elements. "Descendant" elements affect corresponding elements of the higher level of the hierarchy, which are "parent" elements in

relation to the first ones. Matrices of pairwise comparisons are created for all "descendant" elements relating to the corresponding "parent" element. Then it is necessary to obtain assessments of each alternative for each criterion. If there are objective assessments, they are written out and normalized so that the sum is equal to one. However, during the final agreement there are no ready-made numerical data (for example, according to the criterion "The consideration of interests of different social groups" for different sources of financing). Then one should use pairwise comparisons. Let us construct the matrix of pairwise comparisons of six criteria (goals) in accordance with their influence on the overall goal, calculating the matrix maximum eigenvalue λ_{max} , the conformity index (CI) and the conformity ratio (CR).

L0	L11	L12	L13	L14	L15	L16
L11	1	1/3	2/3	1/4	2/7	1/3
L12	3/1	1	3/5	2/3	2/4	3/7
L13	3/2	5/3	1	3/5	2/6	4/3
L14	4/1	3/2	5/3	1	6/5	6/4
L15	7/2	4/2	6/2	5/6	1	5/3
L16	3/1	7/3	3/4	4/6	3/5	1

The criterion of "Practical feasibility" L12 has the moderate predominance over the criterion of "Novelty" L11 - 3/1. The criterion of "Social fairness" L14 has the medium value between the moderate predominance and strong predominance over the criterion of "Novelty" L11, etc. The following method can be offered for the approximate calculation of the matrix Eigen column w (taking into account the property of the antisymmetric matrix that is close enough to the agreed one):

approximation (the calculation algorithm is shown above):

- 1) we summarize elements of each line and record results in the column;
- 2) we add up all elements of the column obtained;
- 3) we divide each element of this column by the amount obtained.

- 1) we multiply the matrix by the corresponding column W ;
- 2) we divide elements of the product column by corresponding elements of the original factor column;
- 3) we find the arithmetic mean of this result. Thus, we determine the value of $\tilde{\lambda}_{max}$.

The matrix conformity index (CI) (the degree of deviation of the positive antisymmetric matrix from the agreed matrix for $\tilde{\lambda}_m \neq 1$) can be calculated as the following ratio:

$$CI = \frac{\tilde{\lambda}_{max} - l}{l - 1}, \tag{1}$$

where, l is the degree of the square matrix (if $\tilde{\lambda}_{max} = l$, then the matrix is agreed).

The priority column (matrix Eigen column) has the form $W = (0.06; 0.13; 0.14; 0.23; 0.26; 0.18)^T$.

We will call the *random index* (RI) the conformity index of the antisymmetric matrix, randomly generated according to the scale from 1 to 9, with corresponding inverse values of elements. Table 3 shows the RI average value versus the matrix degree.

To find the approximate value of the matrix largest eigenvalue $\tilde{\lambda}_{max}$, we use the eigencolumn

Table3.RI versus the matrix degree

Matrix degree	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

The ratio of the CI to the average RI for the matrix of the same degree is called the *conformity ratio* (CR). The CR value less than or equal to 0.10 will be considered acceptable. When analyzing expert responses, only those with $CR \leq 0.10$ were recognized as qualitative expert assessments [35]. If the specified condition was not met, the corresponding table of pairwise comparisons was invalidated, the expert was asked to answer again or he/she was replaced. Therefore, in accordance with the comparison of the approach weight assessment, the criterion of "Novelty" takes the priority 0.06; the criterion of "Practical feasibility" is 0.13; the criterion of "The consideration of interests of different social groups" is 0.14; the criterion of "Social fairness" is 0.23; the criterion of "The freedom to choose a healthcare organization, competitiveness" is 0.26; the criterion of "Economic efficiency" is 0.18. The approximate value of the largest eigenvalue of the matrix under consideration is 6.26. The conformity index is 0.05. The conformity ratio is 0.04. Let us assess the relative importance of CHI, VHI, and MSA to assess the reasonability and effectiveness of the practical application of the specified sources of financing according to the criteria of "Novelty" L11, "Practical feasibility" L12, "The consideration of interests of different social groups" L13, "Social fairness" L14, "The freedom to choose a healthcare organization, competitiveness" L15, "Economic efficiency" L16, comprising the hierarchy level L1 (see Fig. 1). Corresponding matrices of pairwise comparisons, the matrix maximum eigenvalue λ_{max} , CI, CR and priority columns have the form presented below.

L11	CHI	VHI	MSA
CHI	1	1/3	1/5
VHI	3/1	1	3/5
MSA	5/1	5/3	1

$\lambda_{max} = 3.00$; CI = 0.00; CR = 0.00; $w = (0.11; 0.33; 0.56)^T$

At the intersection of the line "VHI" and the column "CHI" the fraction 3/1 is recorded. This record expresses the expert opinion that VHI has the moderate predominance over CHI according to the criterion of "Novelty", i.e. the significance of VHI in the final agreement is 3 times higher than that of CHI.

L12	CHI	VHI	MSA
CHI	1	3/1	7/1
VHI	1/3	1	7/3
MSA	1/7	3/7	1

$\lambda_{max} = 3.00$; CI = 0.00; CR = 0.00; $w = (0.68; 0.23; 0.09)^T$

L13	CHI	VHI	MSA
CHI	1	3/1	1/5
VHI	1/3	1	1/9
MSA	5/1	9/1	1

$\lambda_{max} = 3.04$; CI = 0.02; CR = 0.03; $w = (0.20; 0.07; 0.73)^T$

L14	CHI	VHI	MSA
CHI	1	3/1	1/7
VHI	1/3	1	1/9
MSA	7/1	9/1	1

$\lambda_{max} = 3.12$; CI = 0.06; CR = 0.10; $w = (0.18; 0.06; 0.76)^T$

L15	CHI	VHI	MSA
CHI	1	1/3	1/3
VHI	3/1	1	1
MSA	3/1	1	1

$\lambda_{max} = 3.00$; CI = 0.00; CR = 0.10; $w = (0.14; 0.43; 0.43)^T$

L16	CHI	VHI	MSA
CHI	1	1/2	1/6
VHI	2/1	1	2/6
MSA	6/1	6/2	1

$\lambda_{max} = 3.00$; CI = 0.00; CR = 0.10; $w = (0.11; 0.22; 0.67)^T$

We write the obtained columns in the form of the matrix:

$$\begin{pmatrix} 0.11 & 0.68 & 0.20 & 0.18 & 0.14 & 0.11 \\ 0.33 & 0.23 & 0.07 & 0.06 & 0.43 & 0.22 \\ 0.56 & 0.09 & 0.73 & 0.76 & 0.43 & 0.67 \end{pmatrix}$$

Multiplying this matrix on the right by the column W corresponding to the level of L0, we obtain the required priority column of the hierarchy level L2, weighted according to the general influence of sources of financing, which represents weights of types of sources of financing for healthcare organizations according to the criterion of the reasonability and effectiveness of their practical application (CHI, VHI, MSA) :

$$\begin{pmatrix} 0.11 & 0.68 & 0.20 & 0.18 & 0.14 & 0.11 \\ 0.33 & 0.23 & 0.07 & 0.06 & 0.43 & 0.22 \\ 0.56 & 0.09 & 0.73 & 0.76 & 0.43 & 0.67 \end{pmatrix} \cdot \begin{pmatrix} 0.06 \\ 0.13 \\ 0.14 \\ 0.23 \\ 0.26 \\ 0.18 \end{pmatrix} = \begin{pmatrix} 0.22 \\ 0.22 \\ 0.56 \end{pmatrix}$$

Solving the problem, the mathematical approach was used to agree results of the expert assessment (see above).

3. Results and Discussion

So, in compliance with calculations according to the criterion of the reasonability and effectiveness of the

practical application, sources of financing for healthcare organizations are as follows: 22% are for CHI, 22% for VHI, 56% for MSA. Similar calculations have been made based on responses of

other experts who participated in the survey. So, results of responses of full-time students are presented in Table. 2.

Table2.The survey results of the fourth group of experts “Full-time students”

No.	CHI, %	VHI, %	MSA, %
1	13	53	34
2	40	30	30
3	61	17	21
4	38	16	46
5	16	17	67
6	20	15	65
7	18	24	58
8	33	19	48
9	35	23	42
10	58	27	15
11	35	25	40
12	26	29	45
13	11	27	62
14	33	27	40
15	28	29	43
16	38	28	34
17	48	20	32
18	31	40	29
19	24	42	34
20	13	53	34
21	29	41	30
22	11	25	64
23	13	45	42
24	20	24	56
25	33	31	36
26	32	29	39
27	13	26	61
28	40	22	38
29	22	52	23
30	10	70	20
Average	28.1	31.0	40.9
Mean-square deviation	13.5	13.1	14.1

Results of responses of finance department members of healthcare organizations are presented in Table 3.

Table3.The survey results of the fourth group of experts “Finance department members of healthcare organizations”

No.	CHI, %	VHI, %	MSA, %
1	16	17	67
2	20	15	65
3	18	24	58
4	33	19	48
5	35	23	42
6	58	27	15
7	35	25	40
8	26	29	44
9	11	27	62
10	33	27	40
11	28	29	43
12	38	28	34
13	32	20	48
14	31	40	29
15	24	42	34
16	13	53	34
17	29	41	30
18	11	25	64

19	13	45	42
20	20	24	56
21	33	31	36
22	32	29	39
23	13	26	61
24	40	22	38
25	22	50	28
26	10	70	20
27	30	40	30
28	29	41	30
29	13	27	60
30	32	29	39
Average	26.0	31.5	42.5
Mean-square deviation	11.0	12.0	13.8

Results of responses of all expert groups are presented in summary Table 4.

Table 4. The survey results of all expert groups

Expert group	CHI, %	VHI, %	MSA, %
Finance department members of healthcare organizations	26.0	31.5	42.5
Medical practitioners	22.3	27.9	49.8
Administrative and managerial staff members of medical and preventive treatment facilities	20.9	26.7	52.4
Full-time students	28.1	31.0	40.9
Working citizens	20.3	24.3	55.4
Retirees	31.8	30.3	37.9
Average	24.90	28.62	46.48
Mean-square deviation	4.5	2.8	7.0

3.1. Analysis of results

1. Results presented in Table 4 show that the highest support for CHI among respondents comes for the groups “Retirees” and “Full-time students”. The lowest level of support is among working citizens and administrative and managerial staff members of medical and preventive treatment facilities. Obviously, this is due to the availability of medical care in the CHI system for relevant groups of people. So, for retirees and students, receiving medical care “for free” is important; in fact, they receive it at the expense of funds of working citizens, which are charged in the amount of 5.1% of the payroll budget, in advance, before the citizen receives medical care. The time factor to obtain medical services according to CHI is not determining for students and retirees. A completely different situation exists for working citizens and the first three expert groups, who also belong to the category of working citizens. The time factor to obtain medical services is determining for them, as well as the factor of personifying financial resources on their MSAs, which is an additional factor to motivate these groups of citizens to do efficient work. It is no coincidence that the largest weight of MSA in the final expert assessment is observed in these groups. So, it is the highest in the category of “Working citizens” (55.4%, see Table 4), which reflects the public request of this category to change the system of financing for

domestic healthcare to personify charges for medical services for citizens.

2. The share of VHI is the largest in the category “Finance department members of healthcare organizations” and amounts to 31.5%, which is probably due to the transparency and comprehensibility of financial calculations and cash flows in the VHI system for this category. According to the author of this research article, the same thing explains the high weight of VHI among students. The lowest weight of VHI is among working citizens, because they don’t understand why they have to pay for medical services once again if they have already made charges for the MSA system, and if it is necessary, they will be able to seek medical care on a paid basis, which is easier, quicker and more comprehensible, and above all, the payment is made at the time of receiving medical care, and not in advance.

3. The fact that the least mean-square deviation (MSD) is observed in this category of sources of financing for healthcare organizations (see Table 4 and Table 2) confirms that principles of functioning VHI are more comprehensible for citizens. However, the lowest MSD in the category of CHI is observed among finance department members of healthcare organizations, which, perhaps, can be explained by the specifics of their work. But the largest response dispersion (the highest value of MSD) is in the category of MSA. According to the

author, this is due to the fact that people do not have a clear idea of this source of financing for healthcare organizations, hence the dispersion in assessing the reasonability and effectiveness of the practical application of this source of financing. Nevertheless, the public request to personify charges for medical services is obvious.

4. Conclusion

In consequence of pairwise comparisons, experts have defined matrix maximum eigenvalues, priority eigencolumns, matrix conformity indices, and conformity ratios. The result of the questionnaire survey is the following distribution of expert opinions (in percent, characterizing the degree of preference of the corresponding source of financing for healthcare organizations): CHI 24.90%; VHI 28.62%; MSA 46.48%, which shows the perspective and public support for the transition of financing for national healthcare organizations to medical savings accounts.

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