

A Multi-Criteria Decision Analysis in Health Technology Assessment for All Drugs in Russia

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BACKGROUND

The shortcomings in the current HTA methods when making a decision are rather a formal assessment of most of the characteristics of the drug, which does not have threshold scores for consideration. This can lead to subjective decision-making at the EDL panel, especially since the discussion at the commission is not regulated and is chaotic.

Understanding this problem, it is necessary to find an HTA approach, taking into account the measurement of the factors of the "value" of technologies. In addition, discussions of this issue at conferences and seminars indicate a paradigm shift towards transparency when using other criteria along with traditional clinical and economic analysis and analysis of the impact on the budget.

OBJECTIVE

To improve decision-making mechanisms in the health technologies assessment (HTA) in Russia to eliminate the subjective aspect in decision-making and optimize healthcare costs.

RESULTS

The Multi-Criteria Decision Analysis (MCDA) method of HTA in Russia can help decision-makers assess alternatives based on multiple criteria.

For the development of the MCDA methodology, at the first stage, the most important criteria for local HTA are determined. The weights of this criteria can be determined using the method of expert assessments: the hierarchy analysis method. All criteria will be matched against each other in pairs. Matrices of paired comparisons are constructed for each expert. For matrices of pairwise comparisons, a vector of weights is calculated. Then this vector is normalized to obtain the desired priority vector. As a result, the factors used for the assessment and their weights will be determined.

An excellent approach was taken to further evaluate the drug. If the effectiveness of two alternative drugs A and B for each of the criteria m is equal to $v_m(a)$ and $v_m(b)$, respectively, we can conclude that drug A should be preferable to drug B if $v_m(a) \geq v_m(b)$ by all criteria (with strict inequality for at least one criterion).

This approach can lead to incompatibility if the two drugs are very similar; however, it can be argued that this is appropriate for the assessment process, as further discussion may be required to choose between drugs if their efficacy is very similar.

In this way, the MCDA approach can support rather than replace the existing deliberative process, adding consistency and transparency through explicit evaluation and weighting of criteria.

Evaluation of the effectiveness of drugs by criteria		
Criterion	Drug A $v_i(a)$	Drug B $v_i(b)$
Criterion 1	0.67	0.79
Criterion 2	0.09	0.03
Criterion 3	0.86	0.57
Criterion 4	0.88	0.80
Criterion 5	0.77	0.74

Payoff Ratio Matrix			
Criterion	Weights w_i	Drug A $v_i(a)$	Drug B $v_i(b)$
Criterion 1	13		✓
Criterion 2	4	✓	
Criterion 3	2	✓	
Criterion 4	5	✓	
Criterion 5	3	—	—

$$C(a, b) = \frac{\sum_{i \in Q(a, b)} w_i}{\sum_{i=1}^m w_i} \gg C(a) = \frac{4 + 2 + 5 + 3}{13 + 4 + 2 + 5 + 3} = 0,52$$

- In this example, the index of compliance of drug A with drug B is the sum of the weights in $C(a, b)$.
- The set of criteria by which A is at least as good as B divided by the total sum of the weights ($C(a)$) is equal to 0,52.
- However, the decision can be vetoed due to the poor efficacy of drug A in criterion 1, specifying the veto threshold t_1 as 0.1 for criterion 1 (drug B is better than A in this criterion by 0.12, which is more than the veto threshold t_1).
- Likewise, the index of compliance for drug B with drug A ($C(b)$) is 0.48.
- If $C(a)$ is less than 0.48, drug B is said to be greater than A, provided that the veto thresholds for other criteria are not violated.