

Application of Multi-Criteria Decision Analysis in Russian Health Care

Vitaliy Vladimirovich Omelyanovsky, PhD (Doctor of Medical Sciences), Professor, Head of the Center for Healthcare Funding of the Financial Scientific Research Institute at the Ministry of Finance of Russia, Moscow, Russia; **Vlada Konstantinovna Fedyaeva**, Researcher at the Center for Health Technology Assessment of the Institute of Applied Economic Studies of the Russian Presidential Academy of National Economy and Public Administration (RANEP), Moscow, Russia; and **Olga Yuryevna Rebrova, PhD**, (Doctor of Medical Sciences), Professor at the Department of Medical Cybernetics and Informatics of the N.I. Pirogov Russian National Research Medical University, Moscow, Russia



KEY POINTS . . .

Currently the Russian decision-making process on health technology funding is not structured and not always objective and robust.

Application of Multi-Criteria Decision Analysis (MCDA) methods can contribute to improving decision making.

MCDA has a number of significant advantages over conventional methods of health technology assessment (HTA).



The health care system faces significant new challenges related to the rapid uptake of new medical technologies (MT), their high costs, and consequently low availability to the population. Therefore, the role of health technology assessment (HTA) increases as it focuses on selecting technologies that are more effective from the point of view of both clinical and economic effectiveness. Global experience shows that management decisions on health care funding are based upon judgment of various interest groups and stakeholders, including patients, experts, doctors, health care payers and organizers, politicians, insurance companies, etc. Therefore, development of objective assessment instruments that allow taking into consideration expectations and needs of various interest groups is given increasing attention. Multi-criteria decision analysis (MCDA) represents one of the strategies for complex assessment of new technologies.

Complexity of applying this method relates to its having multiple stages and the fact that adaptation to the conditions of a particular decision-making system and existing values is obligatory.

Definition and Terminology of MCDA

Health care decision making in the Russian Federation is a complex, multistage, and most often, unstructured process that in many cases is based upon incomplete evidence and biased judgment. Now many countries work on transition to evidence-based health care policy, however, data provided by health care technologies developers (pharmaceutical companies and other market players) often remain the only source of evidence. At the same time a wealth of available but incomplete and unmatched evidence does not encourage an easy decision-making process [1]. That said, in the Russian Federation, as well as in other countries, it is vitally important to develop means of structured tracking of cumulative evidence and reasoning that influence decision making.

Let us introduce definitions of the core terms of MCDA.

Alternatives in MCDA are decision options that often tend to be alternative. For instance, alternatives could be different treatment options of any disease.

Criteria are usually those arguments that are taken into consideration when making a decision. For instance, when selecting treatment intervention for a particular patient a doctor usually takes into account the following criteria: effectiveness of medical intervention; its safety; its cost for a patient; time to achieve effect; patient's comfort; availability of intervention, etc.

In its turn, each criterion has its own "measure" (numeric value that shows the importance of the current criterion in terms of solving current problem). In our example, effectiveness could be more important in decision making than convenience of drug administration or time to achieve effect.

There are specific scales to measure each criterion. Scales could be quantitative (e.g. cost of treatment) and qualitative (e.g. safety level).

MCDA is an approach that supports and eases decision-making processes; it is structured and based on the use of clearly defined criteria and rules of decision making that ensures selection of one or another alternative even in the case when they contradict one another. The aim of MCDA is ranking of alternatives, i.e. attributing them to one or another category in order to make objective and transparent assessment of different decision options.

MCDA consists of identifying a set of criteria, their measures and scales, and of integrating criteria values in order to assess each decision variant, and in some cases of developing a certain method that allows referring evaluation of each alternative to a corresponding priority level. Criteria that are relevant to the task in question should be equally applicable to all decision options

(alternatives) which make it possible to differentiate between these options [2, 3].

Advantages of MCDA over other Methods of Decision Making

MCDA is used in different scientific and practical knowledge spheres. When buying any kind of goods (for instance, when choosing a drug in the pharmacy of a certain brand name from the drugs with the same international nonproprietary name), customer usually relies on a couple of criteria (price, dosage, expiry date, manufacturer's name, etc.) and casually (instinctively) selects the best variant. In the situations when responsibility for decision making is huge (and to these situations refer practically all decision making in health care), MCDA application is of vital importance. The purposes of MCDA are:

- 1) comparing different decision options, based on which, selecting both the most preferable and unacceptable variants is feasible;
- 2) comparing decision options when several, sometimes contradictory criteria are available;
- 3) achieving middle ground in the situation when interested parties pursue different objectives and have different values [3]. This very aim is of the utmost interest in relation to MCDA application in the Russian Federation, as health care decisions are usually made by different decision makers with different perspectives upon the areas of concern.

...in the Russian Federation, as well as in other countries, it is vitally important to develop means of structured tracking of cumulative evidence and reasoning that influence decision making.

It is safe to emphasize the following advantages of MCDA over traditional ways of decision making:

- MCDA allows you to find optimal decision in the context of excess amount of random arguments in favor of one out of multiple options;
- It provides a consistent and generic process of decision making by means of using a unified approach in different contexts of decisions in question. Repeatability of the process implies that based on a certain set of features different groups of decision makers, including decision makers on the different level of decision making, would have made the same decision; and
- It ensures a more transparent process of decision making, as on any level of this process a set of criteria and their definitions are available to the external reviewers. Transparency of decision making implies that evidence and other factors taken into account as well as the decision-making process itself are understandable to the external reviewers [3, 4].

Possible Fields of MCDA Application in Health Care

Let us touch upon some fields of MCDA application in health care. We describe only some, the most essential fields of MCDA application, when the actual number of possible application fields is infinite.

MT Registration

Decisions on drugs and other MTs market availability should be made taking into account such factors as patients' life expectancy and quality of life, safety profile of MT, convenience of drug intake and many other factors that are important to the patient. For such decisions, it makes sense to consider the combination of all factors using formal methods like MCDA.

HTA

In HTA, cost-effectiveness analysis traditionally dominates as the main argument used when making decisions on practicability of funding MT, however, in the last year's interest towards HTA analysis which applies a bigger number of criteria as decision-making instruments has increased. Not only clinical effectiveness, safety, and cost effectiveness of MT in question might be used as such criteria but also level of MT innovativeness, impact of MT on patients' quality of life, economic acceptance of MT inclusive of its price, budget impact and some others [5]. Moreover, multi-criteria scales, incorporated in transparent assessment system of MT, might be developed.

Therefore, for each MT and corresponding disease, it is possible to implement a unified assessment and classification system to support decision making on further funding and reimbursement.

Pharmaceutical Supply Policy in Russia

Due to limited capacity to finance pharmaceutical supply in the Russian Federation, development and implementation of approaches to compiling the list of top-priority diseases that need state funding are currently of high interest. It is essential to transfer from inefficient and inconsistent reaction to lobbying activity of the pharmaceutical industry and patients' groups to consistent, transparent, and systematic strategy of prioritizing diseases based on complex analysis of various factors, including features of these diseases and capacity of new technologies in terms of diagnosis and treatment.

To develop criteria that provides ground for compiling the list of top-priority diseases in order to grant state support. MCDA can be used to encourage increased objectivity and transparency of management of decision-making processes on each disease and each corresponding product. Therefore, it is relevant to define and assess relative measured value of the main features of MT and of the corresponding diseases.

MCDA methods can increase objectivity of the decision making also in the situation when there is no effective MT for a certain serious disease and that at the same time there is MT that immensely eases the course of a certain moderate disease.

Drug policy in the area of rare diseases (RD) is a very sensitive issue in the Russian Federation, and MCDA application can promote consensus of the experts and professional communities (including patient organizations) regarding two extremely pressing issues: 1) diseases which costs should be compensated in the first place, and 2) drugs, which should be purchased in the first place. Under conditions of new MT appearing and RD diagnostics improving, implementation and consistent application of MCDA method to support decision making on funding of these diseases will ensure quick review of the orphan diseases list and defining of priority RD for measures of state support, at the same time providing rational use of limited budget funds.



Conclusion

It is complicated to implement MCDA in the decision making as it is more complex than the approaches that are currently in use and as it is dependent on the need to carry out the following stages of MCDA methods' development:

- vast data collection on each of the alternatives (technologies or diseases that call for analysis);
- quantitative evaluation (scale) system development (implies selection of consensus and formalized approach);
- selection of MCDA model;
- validation and assessment of reliability of a new instrument of decision making; and
- organizational changes in the process of decision making and ensuring corresponding qualification of the decision makers.

Nevertheless, MCDA proved to be effective in other spheres, which makes this approach have potential in relation to decision making on all levels of health care system – starting with medical practice and finishing with state policy in health care.

The significant value of MCDA is that it makes it possible to systematically assess any disease in context of the treatment that is available which is especially relevant for such diseases as RD.

References

- [1] Goetghebeur MM, Wagner M, Khoury H, et al. Evidence and value: Impact on decision making—the EVIDEM framework and potential applications. *BMC Health Serv Res* 2008;8:270-86. [2] Thokala P, Duenas A. Multiple criteria decision analysis for health technology assessment. *Value Health* 2012;15:1172–81. [3] Russian National Standard ISO/IEC 31010-2011 Risk Management. Methods of Risk Assessment. Available at: <http://docs.cntd.ru/document/gost-r-iso-mek-31010-2011>. [Accessed December 3, 2014]. [4] Sussex J, Rollet P, Garau M, et al. A pilot study of multicriteria decision analysis for valuing orphan medicines. *Value Health* 2013;16:1163-9. [5] NICE. Social Value Judgements: Principles for the Development of NICE Guidance (2nd Ed.), 2008. Available at: <http://www.nice.org.uk/Media/Default/About/what-we-do/Research-and-development/Social-Value-Judgements-principles-for-the-development-of-NICE-guidance.pdf>. [Accessed December 3, 2014]. ■

For additional information in this issue:

This topic will be presented at the **ISPOR 20th Annual International Meeting** in Philadelphia, PA, USA, during Workshop 15: “The ISPOR MCDA Task Force: How Best to Use It in Health Care Decision Making” (see page 20, [🔗](#)) and as part of a new ISPOR Short Course: “Using Multi-Criteria Decision Analysis in Health Care Decision Making: Approaches & Applications.” This topic will also be presented at the **ISPOR 18th Annual European Congress** in Milan, Italy, during the Third Plenary Session: “Recommendations from the ISPOR Multi-Criteria Decision Analysis Emerging Good Practice Task Force and Remaining Controversies” (see page 23, [🔗](#)) and as part of a new ISPOR Short Course: “Using Multi-Criteria Decision Analysis in Health Care Decision Making: Approaches & Applications” (see page 24, [🔗](#)).

< ADVERTISEMENT >

HEALTH UTILITIES INDEX® (HUI®) for Your Multi-National Clinical Trials

Leading world instrument for
PROs, HRQL and QALYs.

Available in
self & proxy assessment
and
self & interviewer administered
formats.

Multiple languages available to
suit the needs of your study.

Recognized by authorities worldwide.

www.healthutilities.com

