IQWiG Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen

IQWiG Reports

Analytic Hierarchy Process (AHP) – pilot project to elicit patient preferences in the indication "depression"[1]

Executive Summary

[1] Translation of the executive summary of the working paper "Analytic Hierarchy Process (AHP) – Pilotprojekt zur Erhebung von Patientenpräferenzen in der Indikation Depression" (Version 1.0; Status: 08.05.2013). Please note: This translation is provided as a service by IQWiG to English-language readers. However, solely the German original text is absolutely authoritative and legally binding.

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This report was prepared in collaboration with external experts. According to § 139b (3) No. 2 of Social Code Book (SGB) V, Statutory Health Insurance, external experts who are involved in the Institute's research commissions must disclose "all connections to interest groups and contract organizations, particularly in the pharmaceutical and medical devices industries, including details on the type and amount of any remuneration received." The Institute received the completed form "Disclosure of conflicts of interest" from each external expert. The information provided was reviewed by a Committee of the Institute specifically established to assess conflicts of interests. No conflicts of interest were detected that could endanger professional independence with regard to the work on the present commission.

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Background: Health economic evaluation, efficiency frontier and consideration of patient preferences

The "General Methods for the Assessment of the Relation of Benefits to Costs" pursuant to § 35b Social Code Book (SGB) V (in the version effective before 01.01.2011) were published by IQWiG in collaboration with an international expert panel in the autumn of 2009 [1]. These methods are based on the concept of the efficiency frontier. To generate an efficiency frontier, benefits and costs of preferably all alternative health technologies in a therapeutic indication are recorded. The most efficient technologies according to benefits and costs then form the so-called efficiency frontier [2-4]. Pursuant to IQWiG's methods, the efficiency frontiers are initially generated specifically for each outcome. To enable aggregation of outcome-specific efficiency frontiers (e.g. to determine reimbursement prices for recommendation), the results can be weighted and aggregated based on patient preferences.

On the benefit side, the requirements for the generation of an efficiency frontier are study results assessed following the criteria of evidence-based medicine (EbM). In this context, results of patient-relevant outcomes are considered. In accordance with SGB V, patient-relevant outcomes are those outcomes that represent an effect on mortality, morbidity and health-related quality of life of patients [1,5].

As patients are the "end-consumers" of health technologies and services, the consideration of patient preferences within health technology assessments (HTAs) themselves, as well as in HTA-based decision processes (e.g. reimbursement decisions), is of great importance. In many countries HTA institutions therefore regularly involve patients in HTA processes, but this involvement is still often insufficient. Quantitative approaches for measuring patient preferences, such as the Analytic Hierarchy Process (AHP) method, have so far not been used on a regular basis. In the described application of the efficiency frontier approach at IQWiG, there is the possibility of aggregating outcome-specific results by means of weights based on patients' preferences. These preferences in turn can be elicited with different methods of multi-criteria decision analysis (MCDA) such as the AHP method.

Research objective

In this pilot project it was examined to what extent the AHP method can be applied in health economic evaluations in Germany in the identification, weighting and prioritization of multiple patient-relevant outcomes. The possibilities of application were examined using the example of depression and its pharmaceutical forms of treatment (antidepressants).

Methods

In the application of the AHP method, patients and healthcare professionals involved in their treatment are questioned directly. In this context, in structured interviews participants were asked to decide which of two treatment goals / outcomes were more important to them and how much more important this treatment goal / outcome seemed. The results of all pairwise comparisons conducted in this way formed the basis for calculation of the so-called "right

eigenvector", which is derived by means of the matrix algebra. The "right eigenvector" contains relative weights for each of the included outcomes or treatment goals, derived from the preferences expressed in the assessments of the pairwise comparisons.

The AHP pilot project was conducted in two separate surveys for elicitation of preferences; one with patients and one with healthcare professionals involved in the treatment of patients with depression. The individual assessments were discussed in each group questioned in the intervals between the pairwise comparisons of individual goals / outcomes.

Results

The AHP pilot project at IQWiG showed that this was a well-structured and easy-to-implement method. The cognitive demands of the interviews could be handled well by patients and could be implemented in a quiet and relaxed atmosphere in the patient group. Insights into the motives and background of the assessments made by patients and healthcare professionals could be gained by means of the group discussions.

The separate interviews of 12 patients and 7 healthcare professionals led to different weightings. Whereas both groups identified the same 6 of 11 outcomes as the most important ones, the weights within these 6 outcomes deviated between groups. The patients weighted "response" the highest (w = 0.32), whereas the healthcare professionals assigned the highest weight to "remission" (w = 0.48). In the patient group, "response" was followed by "cognitive function" (w = 0.13) "reduction of anxiety" (w = 0.12), "social function" (w = 0.11), "avoidance of relapse" (w = 0.09) and "remission" (w = 0.09). In the group of healthcare professionals, "remission" was followed by "avoidance of relapse" (w = 0.14), "social function" (w = 0.09), "cognitive function" (w = 0.06), "response" (w = 0.06) and "reduction of anxiety" (w = 0.05). Adverse events played a rather minor role; they reached a weight of w = 0.095 for patients und w = 0.08 for healthcare professionals only in an aggregated form (i.e. on a level superordinate to the level of single outcomes as a combined outcome of avoidance of adverse events, including serious adverse events).

Conclusion

This pilot project shows that the AHP method can be applied both in patients and healthcare professionals. The cognitive demands of the interviews were consistently handled well. The structured method of AHP enables elicitation of preferences of individuals for certain treatment goals and outcomes in a step-by-step approach and calculation of the weights for each of these outcomes by means of a matrix algebra.

The pairwise comparisons of outcomes in combination with group discussions enabled an intensive exchange of information, perceptions and experiences between the persons interviewed, and allowed insight into the motives and background of the assessments made by patients and healthcare professionals.

Some methodological challenges were particularly evident in the conduct of the pilot project and should in any case be considered in future AHP surveys. On the one hand, outcomes or treatment goals correlate or overlap. The recording of weights that are too high, which may lead to a "rank reversal", can never be fully prevented but should be tested by means of sensitivity analyses. On the other hand, a question remains open that must also be posed with regard to procedures for recording QALYs or other methods of MCDA: Which persons should be interviewed and how transferable are these results to the entire patient population?

Regardless of the fact that these methodological issues need to be clarified, the AHP method can be used for different questions in the process of HTA production:

- For identification of the (most) relevant outcomes for patients in order to potentially generate efficiency frontiers only for these outcomes.
- For weighting of outcome-specific effect measures (e.g. ORs) and derivation of an aggregated, weighted effect measure for each treatment alternative.
- For aggregation of results from the outcome-specific efficiency frontiers and derivation of an aggregated measure for cost-effectiveness. For example, an aggregated, weighted reimbursement price for a drug can be calculated by weighting the reimbursement prices derived from the various outcome-specific efficiency frontiers.

In addition, the AHP method may provide important indications with regard to which outcomes should primarily be considered in future clinical trials, which ones are more likely to be subordinate, and which ones might not be considered at all.

Keywords: Analytic Hierarchy Process (AHP), decision support techniques, multi criteria decision making, depression, patients' preferences, pilot projects

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