Drug benefit-risk assessment using multi-criteria decision analysis

Drug benefit-risk analysis involves evaluating two or more drugs in terms of multiple benefit and risk criteria in order to determine which of these drugs should be prescribed or granted market access. Making a simple choice from a set of alternatives is straightforward when one alternative dominates the other ones on all criteria. In practice, however, such an alternative can usually not be identified, meaning that a decision maker (e.g., prescribing physician, regulator) is forced to make trade-offs among the different criteria. In this workshop, participants will experience through active engagement in a real-life case study how the use of multi-criteria decision analysis (MCDA) can assist in making the required value judgments explicit and the process by which they are taken into account transparent. This is achieved by taking the participants through the following three phases: problem structuring, scoring of the alternatives against the criteria, and preference modeling.

There is a wide range of preference modeling approaches that all fall under the heading MCDA. In this workshop, we will focus on the use of multi-attribute value theory (MAVT), which has both a strong theoretical foundation and proven applicability in the setting of drug benefit-risk analysis. As we will describe in more detail during the workshop, traditional MAVT relies on relatively complex preference elicitation techniques to specify a decision maker's value function. In practice, however, decision makers are not always able to or willing to provide exact preference statements. In such situations, stochastic simulation can be applied to determine the probability that an alternative performs best given the uncertainty in the decision maker's value trade-offs. Decision support for this latter method is provided by the recently released web-based preference elicitation module of our ADDIS software (www.drugis.org). We will end the workshop by providing a brief demonstration of this software.