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An introduction to pharmacoeconomics, health technology assessment, and multiple-criteria decision analysis

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Given increasing constraints on health care resources and cost, there is a need to assess the relative value of high efficacy therapies for different disease including cancers. In addition, decision makers in middle-income countries also need to manage certain therapeutic categories, especially for chronic disease such as MS, in an attempt to control costs and give access to new, often more expensive, therapies within limited health care budgets. For countries with limited resources, economic evaluations based on decision analytic modeling may be a suitable alternative to extensive trialbased economic evaluations. In this presentation, we are going to review the principals of the methods which are common to investigate the value of new therapies including cost-effectiveness studies, Health Technology Assessment (HTA), and Multiple-criteria decision analysis (MCDA). First of all, the concept of cost in pharmacoeconomics would be reviewed in terms of different perspectives such as payer, health system, and etc. As a multidisciplinary field involving theoretical and practice-oriented research to assess the direct and indirect consequences of health technology use, HTA is currently challenged in various ways. First, despite the increased use of HTA in many jurisdictions, a number of new health technologies—for instance biomedical technologies—are increasingly approved and adopted based on limited evidence on safety and effectiveness, with assessment under real-world conditions being rare, and technologies being used for little or no additional health gain. Second, effective use of HTA requires the involvement of health stakeholders and the implementation of HTA findings, which is far from happening on a routine basis. Third, HTA needs to resolve issues related to the deployment of existing evaluation methods and processes (with some methodological issues, such as the extent to which cost-effectiveness analysis is appropriate to evaluate all types of health technologies, remaining unresolved) and to address the lack of good quality evidence for many evaluation contexts and technologies. Fourth, for HTA to have an impact there is a need to link and align decision processes at distinct health system levels, as decisions at these levels inter-relate. Nevertheless, health technology decision-making by HTA agencies, hospitals and other organisations often remains unconnected. Finally, HTA needs to go beyond the evaluation of pharmaceuticals, with literature acknowledging that other technologies (such as medical devices and health information systems), or, indeed, the broader space of health care interventions, place additional challenges from a methodological and practical perspective. Then, different consequences will be reviewed focusing on the concept of utility and Quality Adjusted Life Years (QALYs). Subsequently, cost-effectiveness plane would be reviewed interpreting the willingness-to-pay threshold for choosing the cost-effective strategies. Then, two common modeling approaches (decision tree and Markov models) would be reviewed. Afterwards, the limitation of cost-effectiveness studies will be discussed together with the concept of deterministic and probabilistic sensitivity analysis. Finally, the HTA and MCDA methods would be reviewed as alternative or complementary methods to cost-effectiveness studies. In view of a tight healthcare budget, these decision analysis methods may provide healthcare decision makers with the requisite insights to make informed choices.

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