Is Cost Effectiveness Modeling Useful?

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In this issue of *The American Journal of Managed Care*, Prosser and colleagues[1] argue that recognition of the value of cost-effectiveness analysis (CEA) to managed care by decision-makers in such organizations rests on 2 requirements: first, knowledge of the technique and, second, an understanding of its potential value in decision-making. While it is no doubt true that many in managed care show little awareness of the techniques of CEA and, indeed, may have little incentive to engage in such analysis, the authors put the blame for failing to factor CEA into decision-making on the managed care organization. They seem to have no real perception that part, indeed a large part, of the blame may lie with the methodology that characterizes CEA assessments.

This may seem a somewhat harsh judgment. After all, the authors do recognize the need for developing standards for conducting CEA from a managed care perspective. Prosser et al, however, don't carry this through to its logical conclusion: that the methodology that characterizes the majority of CEA is simply not relevant to a managed care audience (or, indeed, any other health system audience).

In what we may call traditional CEA, the focus is on the development of clinical trial-based or prescriptive, synthetic decision models. These models make claims for cost effectiveness (or, more accurately, cost efficacy) by contrasting alternative drug therapies in the form of incremental cost outcomes ratios. That is, traditional CEA aims to model the course of a disease and make claims for drug impacts in incidence terms.

From a managed care perspective, such analyses are of limited applicability. A managed care group that is considering whether or not to add a new drug to its formulary in a disease or treatment area has to balance a number of issues. First, what will the impact of the drug be on the outcomes profile for the treating population? Second, are the outcomes that might be achieved consistent with the targets that are set for that disease area? Third, what will the impact be on the cost of treating patients in that disease area? Finally, is the budget allocated to that disease area consistent with the targets set for patient outcomes? While the rationing of healthcare within a constrained optimization environment may seem an ideal situation, in fact it highlights the variables that are critical in a formulary decision-making environment and the need to consider that clinical and cost considerations will interact in allocating patients to alternative therapy interventions. This framework is what is described in the Blue Cross and Blue Shield guidelines for Colorado and Nevada as a "systems impact approach" to drug assessment.[2] A drug impact analysis has to be couched in prevalence or budget period terms, rather than being based on incidence. The impact of a new drug, therefore, has to be modeled in terms of patient switching scenarios. In these, the choice of scenario is determined by the interaction of treatment population characteristics (patients being treated are not homogeneous nor are their responses to therapy), budget constraints, and the treatment targets set for that population. This is a far cry from the traditional CEA approach and will require those espousing standards in pharmacoeconomics not just to think in terms of study perspective, but also to suggest how we might meet these analytical requirements.

Indeed, traditional CEA-based claims are founded on a number of highly unrealistic assumptions: first,

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that all patients (a homogeneous group) are switched from one therapy to another and, second, that constant costs per unit of outcome are obtained. This is a far cry from the real world where the cost per unit of outcome (and hence incremental cost outcome ratios) will vary as the proportion of patients in a treatment population is switched between therapies. As such, claims for cost effectiveness, which are typically decision model-based, are of little interest to drug purchasers (and can be quite misleading).[3]

Interestingly, Prosser et al[1] propose that we "present CEA as a tool for improving health within a budget." This is certainly on the right path, but I am not sure the authors really appreciate the ramifications of what they are suggesting. Are they arguing for a systems perspective? Are they acknowledging that, in the last resort, we are looking to CEA as a management tool—as an analytical and evaluative framework for the risk management of patient populations and the recommendation for intervention strategies that, within budget constraints, will optimize patient outcomes? If they are arguing for systems-based modeling of drug impacts, this was suggested some years ago.[4] Unfortunately, the suggestion fell on deaf ears—although managed care groups have recognized the importance of the systems approach to impact assessment.

If we are to move to a systems-based framework for drug impact assessment, we are going to have to move away from the narrowly clinical decision-making terminology that dominates pharmaceutical economics. The term "cost-effectiveness analysis" is too narrow; and it, unfortunately, perpetuates the traditional outcomes-ratio approach to drug evaluations and the recommended standards supported by groups such as the US Public Health Service Panel.

Unless we move to a systems approach and recognize that we are not meeting the information needs of formulary decision-makers (as set down in managed care guidelines), we must doubt whether pharmaceutical economics has a future.[5] If we believe that, as health or pharmaceutical economists, we can provide a useful input to the allocation and delivery of healthcare, then we must stop blaming others for our own lack of vision and our failure to embrace alternative methodological and analytical frameworks. They may not have the attraction of clinical decision-making or the precision of modeling clinical trial results, but they will force us to meet the information needs of drug purchasers and educate them in techniques that are appropriate to their decision-making environments.

···REFERENCES ···

1. Prosser L, Koplan J, Neuman P, Weinstein M. Barriers to using cost-effectiveness studies in managed care decision making. *Am J Manag Care 2000;6:173-179***.**

2. Langley PC. *Guidelines for Formulary Submissions for Pharmaceutical Product Evaluation.* Denver, CO: Blue Cross and Blue Shield of Colorado and Nevada; 1998.

3. Langley PC, Bhattacharyya SK. Treatment costs, equilibrium and allocation of patients between therapy alternatives. *Clin Ther* 1997;19:830-836.

4. Langley PC, Sullivan SD. Pharmacoeconomic evaluation: Guidelines for drug purchasers. *J Manag Care Pharm* 1996;2:671-677.

5. Langley PC. The future of pharmacoeconomics: A commentary. *Clin Ther* 1997;19:762-769.