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Guidance on Good Practice in Cost-Effectiveness Modeling: Is More Needed?

Christopher McCabe, PhD

BACKGROUND

There is a long established concern that economic evaluations are more liable to provide biased results than traditional forms of research, such as the randomized controlled trial.1–3 These concerns have led to reluctance, in some quarters, to consider such evaluations a suitable basis for decision making.4 The profession has responded to these concerns with increasingly detailed descriptions of the characteristics of good economic evaluations—both trial and model based.5–9 Alongside this development in methodological standards, there has been an increasing use of economic evaluations within real-world health care resource allocation processes.10–14

KARNON AND OTHERS’ IMPACT ANALYSIS

In this issue of the journal, Karnon and colleagues argue that current guidance on good practice in cost-effectiveness modeling needs further development. They describe a cost-effectiveness model of clopidogrel in acute coronary syndrome and demonstrate how extremely large variations in results can be obtained through changing 1 or 2 assumptions.15 The article considers specifically the impact of incorporating incident cases, changing the time horizon, and undertaking age-specific subgroup analysis on the results of the modeled analysis. In addition, the authors observe, correctly, that the risk of error increases with model complexity, and thus, parsimony in model design is desirable.

Underlying all 3 points is the importance of choosing a time horizon that is “long enough to reflect important and valued differences between the long-run consequences and costs of alternative strategies and options.”8

The inclusion of incident cases logically requires an extension of the time horizon to capture all relevant effects. Indeed, unless all important resource and health effects occur in the 1st cycle, then the inclusion of incident cases will require an infinite time horizon, as each cycle introduces a new case that will have to be followed up for at least 1 further cycle to capture all important resource and health effects. If all important effects occur within a single cycle, then there should not be a 2nd cycle, and thus, the issue of incident cases does not arise.

Associated with any given time horizon, except lifetime, is a probability that an important long-run consequence or cost will be excluded from the analysis. Changing the time horizon will change the probability that something important is excluded.
from the analysis. The exact probability is dependent on, inter alia, the natural history of the disease and the mechanism of action of the intervention.

Undertaking age-specific analyses will affect the probability that any given time horizon will exclude important long-run consequences or resource use. All things equal, the impact of reducing the time horizon should be greater for a younger cohort than an older cohort, as the longer life expectancy provides greater opportunity for an important consequence or resource use to occur and thus be inappropriately excluded by a reduced time horizon.

DISCUSSION

Karnon and colleagues conclude that they have “demonstrated the effect of 3 specific issues to the effect that . . . they should now be included in modeling guidelines.” However, each of these 3 effects is a particular demonstration of the importance of demonstrating that the time horizon is “long enough to reflect important and valued differences between the long-run consequences and costs of alternative strategies and options.” Thus, at least 1 of the existing good practice guidelines, if applied correctly, would fully capture the issues the authors outline.

In common with a number of other articles, Karnon and others’ analysis demonstrates that the concern that economic evaluations “can be manipulated more easily and with more subtlety than other forms of evaluation” is a valid one. To address this concern, it is important that the existing guidelines for good practice are used by those organizations that develop or assess cost-effectiveness models for health care decision makers.

Detailed published guidelines are used routinely to assess the quality of clinical articles. By contrast, the peer review of cost-effectiveness models will often rely on the checklist developed by Drummond and Jefferson, which is too general to address many critical issues in cost-effectiveness modeling. Peer review of cost-effectiveness models should be linked explicitly to, although not limited by, existing guidelines. In this way, developers of models will understand the importance of adhering to good practice, and over time, we will develop a greater understanding of the adequacy of current guidelines and how they can be improved.

REFERENCES