

A case study to demonstrate the recommended approach from NICE to assess uncertainty in cost effectiveness models.

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The National Institute for Clinical Excellence (NICE) are embracing a more statistical approach to handle uncertainty in cost effectiveness models. The Appraisal Committee has made it clear that a submission should include a measure of uncertainty about both clinical and cost effectiveness information. They further require that methods should be rigorous to enable the committee *'to quantify the implications of parameter and methodological uncertainty for the results of an analysis.'*

In order to ensure that an assessment of uncertainty is included in submissions, NICE include this assessment in their reference case. In effect this makes such an analysis compulsory as the latest NICE guidance document (NICE, 2004) states that submissions *'should include an analysis of results that use methods described in a reference case'*.

In Section 5.9.3 of the reference case the methodology to assess uncertainty is described. *'All inputs in the analysis will be estimated with a degree of imprecision. Probabilistic sensitivity analysis should be used to translate the imprecision in all input variables into a measure of decision uncertainty in the cost effectiveness of the options being compared. The most appropriate way of presenting uncertainty are confidence ellipses and scatter plots on the cost-effectiveness plane and cost-effectiveness acceptability curves.'*

A case study is presented to demonstrate the use of probabilistic sensitivity analysis for a cost effectiveness model that is made up of a decision tree combined with a Markov model. Probabilistic sensitivity analysis was conducted using second order Monte Carlo simulation to assess the sensitivity of the model to uncertainty in parameters of the model. Estimates of the incremental cost effectiveness ratio (ICER) were calculated for each iteration and displayed on the cost-effectiveness plane. The probability that the treatment was cost-effective for a given threshold for ICER was calculated and presented as a cost-effectiveness acceptability curve.

NICE (2004) Guide to the Methods of Technology Appraisal