



<b>Title</b>	<b>Sensitivity Analysis in Economic Evaluation: An Audit of NICE Current Practice and a Review of Its Use and Value in Decision-Making</b>
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<b>Reference</b>	Volume 13.29. ISBN 1366-5278. <a href="http://www.hta.ac.uk/project/1673.asp">www.hta.ac.uk/project/1673.asp</a>

## Aim

To determine how we define good practice in sensitivity analysis in general and probabilistic sensitivity analysis (PSA) in particular, and to what extent it has been adhered to in the independent economic evaluations undertaken for the National Institute for Health and Clinical Excellence (NICE); to establish what policy impact sensitivity analysis has in the context of NICE, and policy-makers' views on sensitivity analysis and uncertainty, and what use is made of sensitivity analysis in policy decision making.

## Conclusions and results

The review and the policy impact assessment focused exclusively on documentary evidence, excluding other sources that might have revealed further insights on this issue. Some cost-effectiveness work, especially around the sensitivity analysis components, represents a challenge in making it accessible to those making decisions. This speaks to the training agenda for those sitting on such decision-making bodies, and to the importance of clear presentation of analyses by the academic community. Practice in relation to univariate sensitivity analysis is highly variable, with considerable lack of clarity in relation to the methods used and the basis of the ranges employed. In relation to PSA, there is a high level of variability in the form of distribution used for similar parameters, and the justification for such choices is rarely given. Virtually all analyses failed to consider correlations within the PSA, and this is an area of concern. Uncertainty is considered explicitly in the process of arriving at a decision by the NICE Technology Appraisal Committee, and a correlation between high levels of uncertainty and negative decisions was indicated. The findings suggest considerable value in deterministic sensitivity analysis. Such analyses highlight which model parameters are critical to driving a decision. Strong support was expressed for PSA, principally because it indicates the parameter uncertainty around the incremental cost-effectiveness ratio.

## Recommendations

Both deterministic and probabilistic sensitivity analyses should be used to address parameter uncertainty. For methodological and structural uncertainties, repeated analyses should be run using different models in which uncertainties regarding model structure exist, or different methods in which there are uncertainties. In the process of conducting and implementing sensitivity analyses, good practice would involve a clear and full justification of the choice of included variables, along with an explanation of the information source used to specify the ranges. Threshold analysis should be supported, especially where the value of a particular parameter is indeterminate, but a rationale for, and definition of, the threshold applied should be provided. Regarding PSA, distributions should be placed around all important model parameters, and any excluded parameters must be justified. The distributional assumption for each variable should be justified and should relate to the nature of the variable. The distribution should be consistent with any logical bounds on parameter values given its nature. There might be value in clearer methodology guidelines on which distributions are appropriate for which parameters. Where correlation between variables is expected, joint distributions should be used, and independence should not be assumed.

## Methods

See Executive Summary link [www.hta.ac.uk/project/1673.asp](http://www.hta.ac.uk/project/1673.asp).

## Further research/reviews required

See Executive Summary link [www.hta.ac.uk/project/1673.asp](http://www.hta.ac.uk/project/1673.asp).