Methods to Construct a Step-By-Step Beginner's Guide (BG) to Decision Analytic Cost Effectiveness Modelling

Supplementary Appendix

Contents

1 Final 156 Steps in the Beginner's Guide

Module 1 - Understanding the Decision Problem	
Decision Question	State the decision question that the model seeks to address
Country Context	State the continent and country where the decision will be made.
Decision Perspective	State and justify the perspective to be used for the model.
Model Purpose	Describe the purpose of the model
Cost Perspective	List all potential costs relevant to the decision perspective
Outcome (Effects) Perspective	List all potential outcomes (positive and negative) relevant to the decision perspective
Funding Source	State all sources of funding and the relationships between sponsor, model developers and model user.
Intervention	State and describe the intervention
Comparator Context	List all known comparator interventions in current practice and/or future practice and consider the extent to which each of these are relevant to the decision problem.
Clinical Context	Delineate the clinical setting in which the intervention is used.
Patient Context	Describe the patient characteristics of the population for which the intervention is used.
Diagnostic Context	Define the disease stage/classification for which the intervention will be used.
Disease Context	Describe the natural history and/or progression of the disease and show at which stage the intervention is used.
Treatment Context	Describe the treatment pathway or sequence of treatments relative to which the intervention will be used.
Literature Sources	List any research-based and non-research based evidence sources used to inform understanding the decision problem.
Clinical Personnel Consultation	Discuss with clinical personnel and senior modellers the intervention; potential comparator/s; clinical; patient; diagnostic; disease and treatment context.

Senior Modeller Consultation	Consult a senior modeller on all of the steps involved in understanding the decision problem.
Module 2 - Conceptual Model Building	
Model Comparator	Consider which comparator will be modelled and why.
Time Horizon	Consider the appropriate time horizon to be modelled.
Model Structure	Consider which model structure will be used.
Model Structure - Rationale	Explain and justify the model structures in Co3
Individual versus Aggregate Patient Modelling	Consider whether the patient characteristics lend themselves to aggregate population or individual patient modelling and explain how this can be accounted for by the potential model structures.
Timing of Events	Consider the timing of events and how it may be accounted for by the chosen model structure.
Uncertainty Method	Consider which method will be used to handle uncertainty in the model and consider how this is appropriate within the chosen model structure.
Interaction	Consider interaction between variables and how they may be accounted for by the potential model structure.
Model Output	State the planned model output
Overall Patient Population	Describe the overall patient population for which the intervention will be used.
Overall Patient Population - Selection Criteria	Define the diagnostic or other criteria used to determine the use of the intervention in the "overall patient population".
Overall Patient Population - Selection Method	Describe the existing and/or future (proposed) methods for determining the criteria named in "overall patient population - selection criteria" .
Subgroup Patient Population	Describe any subgroup patient population for which the intervention will be used and justify the need for a subgroup analysis.
Subgroup Patient Population - Selection Criteria	Define the diagnostic or other criteria used to determine the use of the intervention in the "subgroup patient population".
Subgroup Patient Population - Selection Method	Describe the existing and/or future (proposed) methods for determining the criteria named in "subgroup patient population - selection criteria" .
Individual Patient, Cohort or Population Model	State and justify whether indivdual patients, a patient cohort or population model will be used.
Literature Sources	List the research-based and non-research based evidence used to inform the conceptual model building phase.
Data Availability	Describe whether the available data addresses the potential structure of the model

Clinical Personnel Consultation	Discuss and verify interpretation of the information about the intervention, comparator, clinical; patient; diagnostic; disease and treatment contexts, time horizon, timing of events, population and subgroups.
Senior Modeller Consultation	Consult a senior modeller on all of the issues considered during phase 2 of model development.
Module 3 - Model Implementation	
Model Structure	Select, describe and illustrate the model structure from potential model structures identified during conceptualization.
Model Structure - Assumptions	State and justify all model structure assumptions and estimate the direction and potential magnitude of bias which may result.
Software	State the computer software used for the modelling approach
Measure of Effect	State and justify the measure of effectiveness chosen to present the model results.
Patient Sample Data - Literature Search	Document the literature search strategies and the different sources of information used to identify patient sample data.
Patient Sample Data - Literature Selection	Describe the process of weighing up the available evidence and any trade-offs in relevance and/or quality which were made in selecting the final evidence to be used in the model.
Patient Sample Data	Tabulate patient sample data which will be used in the model with reference to description, source of information and any assumptions made.
Patient Sample Parameters - Point Estimate	State and justify any patient sample point estimate/s used, if applicable.
Patient Sample Parameters - Distributions	State and justify the distribution assigned to the patient sample parameters.
Patient Sample Parameters -Models	State and justify models assigned to patient sample parameters.
Patient Sample Parameters - Secondary Estimates	Describe and justify distributions assigned to parameters obtained from secondary data.
Patient Sample Parameters - Pooled Estimates	State and describe the methods used to pool patient sample parameters
Patient Sample Parameters - Other Methods	Describe and justify patient sample parameters derived from other methods not documented in I8-12.
Patient Sample Parameters - Correlation	State whether patient sample parameters are correlated both within the intervention and/or comparator/s respectively or between the intervention and/or comparators. If correlated, explain how, and describe the methods used to address this correlation.

Patient Sample Parameters - Extrapolation	Describe and justify the methods used to extrapolate patient sample parameters over time.
Patient Sample Parameters - Assumptions	List and justify all patient sample data-related assumptions
Resource Use Data - Literature Search	Document the literature search strategies and the different sources of information used to identify patient sample data.
Resource Use Data - Literature Selection	Describe the process of weighing up the available evidence and any trade-offs in relevance and/or quality which were made in selecting the final evidence to be used in the model.
Resource Use Data	Tabulate resource use data which will be used in the model with reference to resource description, quantity, source of information and justification of selection and any assumptions made.
Resource Use Data - Excluded	Document and justify resource use data which has been excluded.
Resource Use Data - Missing	Document resource use data which is missing and describe methods used to calculate or account for it.
Resource Parameters - Distributions	State and justify the distribution assigned to the resource parameters.
Resource Use Data - Assumptions	List and justify all resource use data-related assumptions
Cost Data	Tabulate cost data which will be used in the model with reference to cost description, value, source of information and justification of selection and any assumptions made.
Cost Data - Direct Medical	Tabulate direct medical costs and sources used
Cost Data - Direct Non-medical	Tabulate direct non-medical costs and sources used
Cost Data - Productivity Loss	If a societal perspective has been adopted, describe and justify the method used to value productivity loss in the model.
Cost Data - Transfer Costs	Describe the methods used to include transfer costs.
Cost Data - Indirect Costs	Describe the methods used to include indirect costs, and justify their inclusion in the model.
Cost Data - Future Costs	Describe the methods used to value future costs, and justify the inclusion in the model.
Cost Data - Drug Unit Cost	Standardize and document drug unit costs according to volume and active pharmaceutical ingredient
Cost Data - Original Year	Document the health consumer price index corresponding to the country of original data, and the

	methods used to inflate cost data from previous years to present time.
Cost Data - Original Country	Document conversion of cost data from foreign to local currency per unit of active ingredient and the exchange rate/s used.
Cost Data - Missing	Document missing cost data and and describe methods used to calculate it.
Cost Data - Assumptions	List and justify all cost-related assumptions
Cost Data - Discounting	State and justify the discount rate used for costs.
Cost Parameters - Point Estimates	State and justify any point estimate/s used.
Cost Parameters - Distributions	State and justify the distribution assigned to the cost parameters.
Cost Parameters - Models	Describe and justify models assigned to cost parameters.
Cost Parameters - Secondary Estimates	Describe and justify distributions assigned to parameters obtained from secondary data.
Cost Parameters - Other Methods	Describe and justify patient sample parameters derived from other methods not documented.
Cost Parameters - Correlation	State whether cost parameters are correlated both within the intervention and/or comparator/s respectively or between the intervention and/or comparators. If correlated, explain how, and describe the methods used to address this correlation.
Cost Parameters - Extrapolation	Describe and justify the methods used to extrapolate cost parameters over time.
Clinical Outcome Data - Included (Positive and Negative)	Tabulate positive and negative clinical outcomes included in the model with reference to description, source of information, evidence grade and justification for use.
Clinical Outcome Data - Excluded (Positive and Negative)	Tabulate positive clinical outcomes excluded with reference to description, source of information, evidence grade and justification for non-use, and how these have been included in the model.
Clinical Outcome Data - Missing	Document missing outcome data and describe methods used to calculate it.
Clinical Outcome Parameters - Point Estimates	State and justify any point estimate/s used.
Clinical Outcome Parameters - Distributions	State and justify the distribution assigned to the clinical outcome parameters.

Clinical Outcome Parameters -Models	Describe and justify models assigned to clinical outcome parameters
Clinical Outcome Parameters - Secondary Estimates	Describe and justify distributions assigned to parameters obtained from secondary data.
Clinical Outcome Parameters - Pooled Estimates	State and describe the methods used to pool clinical outcome parameters
Clinical Outcome Parameters - Other Methods	Describe and justify clinical outcome parameters derived from other methods not documented in I47-51
Clinical Outcome Parameters - Correlation	State whether clinical outcome parameters are correlated both within the intervention and/or comparator/s respectively or between the intervention and/or comparators. If correlated, explain how, and describe the methods used to address this correlation.
Clinical Outcome Parameters - Extrapolation	Describe and justify the methods used to extrapolate clinical outcome parameters over time.
Clinical Outcome Parameters - Assumptions	List and justify all clinical outcome-related assumptions (positive and negative)
Intermediate Outcomes	Justify the use of intermediate outcomes and demonstrate (model) the relationship between the intermediate and final outcome. Document the methods used to extrapolate intermediate to final outcomes.
Utility Data - Literature Search	Document the literature search strategies and the different sources of information used to identify patient sample data.
Utility Data - Literature Selection	Describe the process of weighing up the available evidence and any trade-offs in relevance and/or quality which were made in selecting the final evidence to be used in the model.
Utility Data	Tabulate utility data with reference to description, source of information, evidence grade, justification for use and any assumptions made.
Utility Data - Missing	Document missing utility data and describe methods used to calculate it.
Utility Parameters - Point Estimates	State and justify any point estimate/s used.
Utility Parameters - Distributions	State the distribution chosen, the method used and the rationale for selection of the distributions assigned to the utility parameter estimates.
Utility Parameters -Models	Describe and justify models assigned to utility parameters.

Utility Parameters - Secondary Data	Describe and justify distributions assigned to utility parameters obtained from secondary data.
Utility Parameters - Pooled Estimates	State and describe the methods used to pool utility parameters
Utility Parameters - Other Methods	Describe and justify utility parameters derived from other methods not documented
Utility Parameters - Correlation	State whether utility parameters are correlated both within the intervention and/or comparator/s respectively or between the intervention and/or comparators. If correlated, explain how, and describe the methods used to address this correlation.
Utility Parameters - Extrapolation	Describe and justify the methods used to extrapolate utility parameters over time.
Utility Parameters - Assumptions	List and justify all utility parameter-related assumptions (positive and negative)
Utility Parameters - Discounting	State and justify the discount rate for utilities. If differential discounting has been used describe and justify.
Preferences Elicited - Origin	State and justify whose preferences have been elicited.
Preferences Elicited - Direct	State and justify the method chosen to elicit direct preferences.
Preferences Elicited - Generic	State and justify the method chosen to elicit generic preferences.
Preferences Elicited - Disease Specific	State and justify the method chosen to elicit disease specific preferences.
Preferences Elicited - Valuation Reference Population	Describe the population used to value the elicited preferences.
Mapping -Generic Non-preference to Generic Preference-based Index	Justify and describe the methods used to map a generic non-preference based measure onto a generic preference-based index
Mapping - Condition-Specific Non-preference to Generic Preference-based Index	Justify and describe the methods used to map a condition specific non-preference based measure onto a generic preference-based index
Transition Probabilities	Tabulate transition probabilities with reference to the source, distribution assigned and rationale for the distribution.
Interval Probabilities to Instantaneous Rates	Describe the methods used to transfer interval probabilities to instantaneous rates.

Relative Risk Parameters - Distributions	Describe and justify the distribution/s assigned to relative risk parameters
Time to Event Data - Survival Analysis	State the distribution chosen, the method used and the rationale for selection of the distributions assigned to the time to event data
Matching Cost and Outcome Data Over time	Describe, if applicable, how cost and outcome data have been matched over time.
Preliminary Results and Revisions	Run the model to determine the preliminary results.
Senior Modeller Consultation	Show and discuss with a senior modeller the model after it is implemented.
Clinical Personnel Consultation	Discuss with a clinical person the final model structure and assumptions.
Model Commisioner Consultation	Reconsult with the organisation commisioning the model to confirm your understanding of the decision question and model requirements.
Module 4 - Model Checking	
Modelling Uncertainty	Document, graph and justify the methods used to quantify the model structure uncertainty potentially arising from the components identified in the uncertainty identifier column.
Methodological Uncertainty	Document, graph and justify the methods used to quantify the methodological uncertainty potentially arising from the components identified in the uncertainty identifier column.
Parameter Uncertainty	Document, graph and justify and justify the methods used to quantify the parameter uncertainty potentially arising from the components identified in the uncertainty identifier column.
Evidence Quality Uncertainty	Document, graph and justify the methods used to quantify the uncertainty potentially arising from the mix of evidence quality from which the model structure and parameters have been derived.
Face Validity	Document steps taken to check the face validity of the model potentially arising from the components identified in the validity identifier column.
Internal Validity	Document steps taken to check the internal validity of the model potentially arising from the components identified in the validity identifier column.
Convergent Validity	Document steps taken to check the convergent validity of the model potentially arising from the components identified in the validity identifier column.
Predictive Validity	Document steps taken to check the predictive validity of the model potentially arising from the components identified in the validity identifier column.

External Validity	Document steps taken to check the external validity of the model potentially arising from the components identified in the validity identifier column.
Overall Validity	Document steps taken to check the overall validity of the model not described in Ch1-5.
Literature Sources	List the research-based and non-research based evidence used to check the validity of the model in Ch1-6
Calibration	Document comparison of model outputs to data at aggregate level.
Bias	Describe the potential bias arising from the components identified in the other identifier column
Heterogeneity	Describe steps taken to address the heterogeneity potentially arising from the components identified in the "other identifier column".
Within Model Extrapolation (Quantitative)	Describe and justify the methods used to quantitatively extrapolate data within the model.
Impact of Within Model Extrapolation on Results	Estimate the impact of the within model extrapolation on the model results
Outside Model Extrapolation (Qualitative)	Provide a qualitative description of potential implications if the model results are extrapolated beyond the modelled time frame.
Senior Modeller Consultation	Demonstrate and discuss with a senior modeller all steps taken to check the model.
Module 5 - Engage with the decision	
Conflict of interest	Declare all conflict of interest.
Model Funding	Declare all sources of funding and the relationships between sponsor, model developer and model user.
Storage of Analyses and Results	Store relevant parameter and data sets to enable presentation of a range of results (potentially at follow-up)
Results: Base Case	Present base case results of the model suitable to the decision context.
Results: Scenario	Present all scenario results of the model suitable to the decision context.
Results: Subgroup Analysis	Present all subgroup analysis results of the model suitable to the decision context.
Within Model Uncertainty - Parameter	Summarize the methods used to characterise the parameter uncertainty and present the results.

Within Model Uncertainty - Methodological	Summarize the methods used to characterise the methodological uncertainty and present the results.
Within Model Uncertainty - Model Structure	Summarize the methods used to characterise the model structure uncertainty and present the results.
Uncertainty of the Results	Present the uncertainty of the results
Summary of Within Model Uncertainty	Summarize the steps taken to characterize uncertainty and the degree of uncertainty around the model, methods, and parameters from the exploration of uncertainty in Ch1-4.
Summary of Validity	Summarize the validation steps and findings according to Ch5-11.
Summary of Bias	Summarize the magnitude and direction of any potential bias explored in Ch13.
Summary of Heterogeneity	Summarise any subgroup analysis undertaken to improve heterogeneity in the analysis.
Senior Modeller Consultation	Show all results and discuss with a senior modeller.

2 Systematic Review of Guidelines

The systematic search was completed in February 2009 with monthly alerts on-going via key database providers, and an update performed in January 2011. A systematic review of best practice guidelines was performed to identify all steps and submethods potentially undertaken during model development. Best practice guidelines were defined as publications for the purpose of improving the methods and quality of CEM published by health economics experts or organizations such as International Society for Pharmacoeconomic Outcomes Research (ISPOR). A combination of model and guideline search terminology was applied in searches using the following databases: Allied and Complementary Medicine (AMED), Biosis Previews, Embase, Global Health, International Pharmaceutical Abstracts, Medline, PsycINFO, CSA Illumina, Applied Social Sciences Index and Abstracts (ASSIA), Web of Science, Cinahl – EBSCO, Centre for Reviews and Dissemination (CRD) - HTA, NHSEED, Database of Abstracts of Reviews of Effects (DARE), Evidence-Based Medicine (EBM) Reviews - ACP Journal Club (ACP), Cochrane Database of Systematic Reviews (CDSR), Cochrane Controlled Trials Register (CCTR), and Cochrane Methodology Register

(CMR). The following predetermined selection criteria were applied in a two stage screening process of title and abstract and then full text selection as shown below:

Inclusion criteria:

- English language.
- Published between 1970 to February 2009, updated Feb 2011.
- Includes guidance or good practice recommendations for CEM.
- Publications making recommendations for, providing best practice and giving recommendation or guidelines for CEM.

Exclusion criteria:

- Decision analysis applied to clinical scenarios e.g. clinical guidelines, clinical pathways, and clinical algorithms.
- Models used for quality assurance programmes or management decisions.
- Use of modelling in another area/discipline e.g. genetics, social policy etc.
- Actual model descriptions or models published including Cost Effectiveness Analysis (CEA), DACEM, Cost Utility Analysis (CUA), Cost Minimisation Analysis (CMA), Cost Benefit Analysis (CBA), HTA decision tree model, cost analysis, Monte Carlo simulation, Markov model or other mathematical models.
- Economic evaluations alongside controlled trials (EEACT).
- Outcome analysis, publications evaluating an outcome measure.
- Conference abstract, book review etc.
- Publications evaluating model quality.

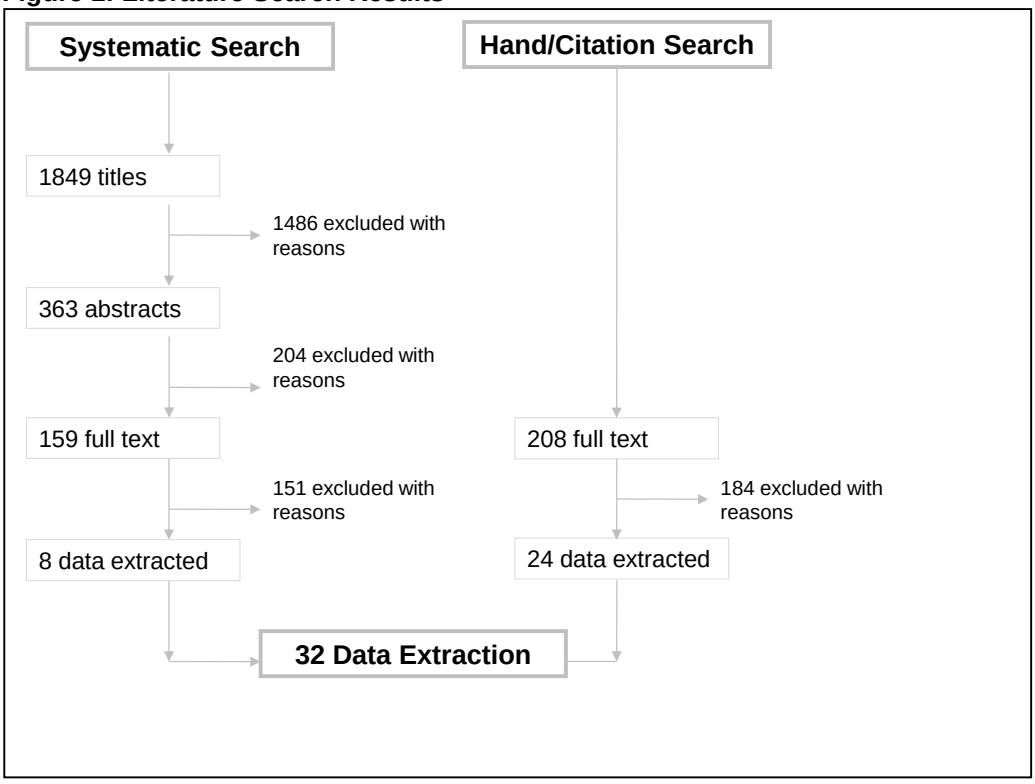
Excluded publications were documented with reasons for exclusion. No quality appraisal was performed of the literature because the sources of literature (peer reviewed journals, book chapters) were considered to represent a certain minimum quality. The search and review were performed by TR and checked by RE.

Literature Search Results

The systematic search identified 1,849 titles of which 1,486 titles were excluded with reasons. Three hundred and sixty three abstracts were reviewed and 159 full text publications were retrieved for review, of which eight met the selection criteria for data extraction. For quality control purposes a comparison was made with the review of guidelines from 2004 (Philips et al. 2004). At least 9 publications were not identified

by the search. Analysis of the search strategy and the publications not identified showed that many publications do not have the title of 'guidelines', nor do they contain the term 'guideline' in the abstract. To overcome this limitation of the literature search, extensive citation snowballing was carried out to cross reference identified papers and retrieve related literature. Specifically the reference list from the Philips et al. (2004) review was cross referenced with the papers identified through the literature search. Also, for each health economic guideline used for the data extraction, the reference list was cross-referenced to identify any important guidelines which had been cited but not identified through the literature search strategy. This method identified 208 publications of which 24 were included for data extraction. This literature search process is shown in Figure 1. The final 32 health economics guidelines were included for data extraction.

Figure 1: Literature Search Results



Researcher's own illustration

The literature search was updated in January 2011 to look for guidelines published between January 2009 and January 2011. The systematic search identified 55 title/abstracts, of which thirty eight were excluded with reasons and 14 were reviewed and included in the methods review. Three publications were considered for inclusion along with the 32 health economics guidelines (see below), however no additional

content for the different components was identified, all information in these three publications was already included in the data extraction.

For the purpose of the research, guidelines were divided into two types, defined according to who developed them and for what purpose as follows:

- *Health economics guidelines* are recommendations for the purpose of improving the methods and quality of CEM and are typically developed by health economics experts or organizations such as ISPOR.
- *Reimbursement guidelines* are guidelines developed by country-specific regulatory organizations such as NICE, Australian Pharmaceutical Benefits Board and the Canadian Association for HTA to support manufacturer submissions for reimbursement and formulary decisions.

Health economics guidelines are considered to generally underpin reimbursement guidelines and therefore they formed the basis of the outline of the guide.

The literature search results showed an increase in guidelines published from 1985 to 2009, with the majority (19/32, 59%) of publications emerging between 1995 and 2000. Of the 32 guidelines extracted, 19 were explicitly called guidelines; two were book chapters and 11 were publications which provided recommendations for modelling. Sixteen publications originated from the USA, nine from the UK, two from Spain, one from the Netherlands and three from cross-continental collaborations.

Four publications were funded by the US Public Health Service and one by the National Library of Medicine/Agency for Health Care Policy and Research. One was funded by the National Institute of Health (NIH) and one by ISPOR. Seven were funded by the pharmaceutical industry, either directly or via university grants. Eighteen publications (including two book chapters) disclosed no source of funding. Eight publications referred to economic evaluations, six to cost effectiveness analysis, five to pharmacoeconomic analysis and thirteen specifically to CEM. For three of the publications it was unclear during which phase of model building they were designed to be used; of the remaining twenty-nine publications: six were for use during the model development phase, three for reporting, four for model review and eleven for combinations of development and dissemination (reporting, review or publication) phases.

During literature review a subset of literature emerged which referred to disease-specific recommendations and guidelines. These are publications which suggested or proposed recommendations, 'reference case' or guidelines for specific diseases. The original objective of the research was to develop a guide which could be applied to developing a model for any disease area, however once this literature emerged it was necessary to determine whether this was feasible or whether separate guides would need to address separate disease areas. These publications were reviewed with the intention of

- Determining disease specific modelling issues (if any).
- Gaining insight into disease specific modelling issues (if any).
- Addressing disease specific issues in the guide, where and if possible.

The disease specific modelling publications were reviewed, however all of the issues identified were considered to apply to models in general; and none were unique to models for a specific disease. The issues raised in these publications are identified as areas creating challenges in designing and developing models, regardless of the target therapy or disease in question. It was therefore considered unnecessary to include disease specific sections in the guide.

Critical analysis, logic and derivation were used to synthesise the extracted guidelines into an exhaustive outline of components which the guide would need to address.

3 Guidelines Used to Create the Outline of the Beginner's Guide (n=32).

Publication Title	**Reference**
Chapter in Assessing Medical Technology	Eddy 1985
Guidelines for the clinical and economic evaluation of healthcare technologies.	Guyatt 1986
Reader's Guide for Clinical Economics Articles: Research on Value-for-Money in Medical Care	Eisenberg 1991
Guidelines for performing a Pharmacoeconomic analysis	Jolicoeur Jones-Grizzle & Boyer 1992
Guidelines for Pharmacoeconomic Studies	McGhan & Lewis 1992

Evaluation of Pharmacoeconomic Studies: Utilization of a checklist	Sacristan Soto & Galende 1993
Toward a peer review process for medical decision analysis models.	Sonnenberg et al. 1994
Evaluation of Published Pharmacoeconomic Studies	Johnson & Coons 1995
Methods of cost effectiveness analysis: areas of consensus and debate	Luce & Simpson 1995
Economic Analysis of Health Care Technology: A report on principles	Task Force on Principles for Economic Analysis of Health Care Technology 1995
Guidelines for the authors and peer reviewers of economic submission to the BMJ	Drummond Jefferson & Buxton 1996
The role of cost effectiveness analysis in health and medicine Part I	Russell et al. 1996
Recommendations for reporting cost-effectiveness analyses Part III	Siegel et al. 1996
Recommendations of the panel on cost effectiveness in health and medicine: Part II	Weinstein et al. 1996
Modelling in economic evaluation: an unavoidable fact of life	Buxton et al. 1997
Pharmacoeconomics: Evaluating the Evaluators	Haycox & Walley 1997
Guidelines for pharmacoeconomic Studies Recommendations from the panel on cost effectiveness in health and medicine	Siegel et al. 1997
Health and Economic Outcomes Modeling Practices: A Suggested Framework	Halpern et al. 1998
Reporting Format for economic evaluation Part II: Focus on modelling studies	Nuijten 1998
Methodologic Principles of Cost Analyses in the Nursing, Medical, and Health Services Literature, 1990-1996	Chang & Henry 1999

Weighing the Economic Evidence: **Guidelines** for Critical Assessment of Cost-Effectiveness Analyses	Ramsey & Sullivan 1999
Systematic validation of disease models for pharmacoeconomic evaluations	Sendi et al. 1999
Decision Analytic Modelling in the Economic Evaluation of Health Technologies A Consensus Statement	Akehurst et al. 2000
Modelling in Health Economic Evaluation What is its Place? What is its Value?	Brennan & Akehurst 2000
Testing the Validity of Cost-Effectiveness Models	McCabe & Dixon 2000
Assessing Quality in Decision Analytic Cost-Effectiveness Models A Suggested Framework and Example of Application	Sculpher Fenwick & Claxton 2000
Modeling for Health Care and Other Policy Decisions: Uses, Roles, and Validity	Weinstein et al. 2001
Health economic evaluations using decision analytic modelling. Principles and Practices—Utilization of a Checklist to Their Development and Appraisal	Soto 2002
Principles of good practice of decision analytic modeling in health care evaluation: Report of the ISPOR Task Force on Good Research Practices-Modeling Studies.	Weinstein et al. 2003
Modelling in the Economic Evaluation of Healthcare: selecting the appropriate approach.	Barton Bryan & Robinson 2004
Review of **guidelines** for good practice in decision analytic modelling in health technology assessment	Philips et al. 2004
Guidance on Good Practice in Cost-Effectiveness Modeling: Is More Needed?	McCabe 2007

4 Focused Search Strategies For Submethods Review

Focused literature searches were performed to identify methods literature for the submethods and steps already identified.

Table 1 summarises the database searched, the search string and the number of hits.

Table 1: Focused literature search strategies for methods review

Database	Search Details	Results
Embase 1996 to 2011 Week 05	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (21344)	19
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (70572)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (344181)	
	4 economics/ or exp resource management/ (116878)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (234573)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (114078)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (1179158)	
	8 exp statistical model/ or exp uncertainty/ (68989)	
	9 individual based population model/ (99)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (344181)	
	11 exp medical decision making/ (51604)	
	12 exp practice guideline/ (225465)	

	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (1633461)	
	14 Model# approach.m_titl. (8)	
	15 Model# method#.m_titl. (14)	
	16 (Type adj5 model#).m_titl. (251)	
	17 14 or 15 or 16 (273)	
	18 13 and 17 (101)	
	19 limit 18 to (human and english language and last 5 years) (19)	
	20 from 19 keep 1-19 (19)	
Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 10, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (26085)	13
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (76507)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (2165)	
	4 economics/ or exp resource management/ (25793)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (275530)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (261712)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (95361)	

	8 exp statistical model/ or exp uncertainty/ (188568)	
	9 individual based population model/ (0)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (84039)	
	11 exp medical decision making/ (67738)	
	12 exp practice guideline/ (14798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (651077)	
	14 Model# approach.m_titl. (7)	
	15 Model# method#.m_titl. (21)	
	16 (Type adj5 model#).m_titl. (273)	
	17 14 or 15 or 16 (301)	
	18 13 and 17 (50)	
	19 limit 18 to (human and english language and last 5 years) (13)	
Medline Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 10, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (26085)	11
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (76507)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (2165)	

	4 economics/ or exp resource management/ (25793)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (275530)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (261712)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (95361)	
	8 exp statistical model/ or exp uncertainty/ (188568)	
	9 individual based population model/ (0)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (84039)	
	11 exp medical decision making/ (67738)	
	12 exp practice guideline/ (14798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (651077)	
	14 (Cost# adj4 method#).m_titl. (66)	
	15 (Cost# adj4 data).m_titl. (70)	
	16 (Calculation adj2 cost).m_titl. (34)	
	17 14 or 15 or 16 (170)	
	18 13 and 17 (71)	
	19 limit 18 to (english language and humans and last 5 years) (11)	
Embase 1996 to 2011 Week 05	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (21344)	19

	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (70572)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (344181)	
	4 economics/ or exp resource management/ (116878)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (234573)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (114078)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (1179158)	
	8 exp statistical model/ or exp uncertainty/ (68989)	
	9 individual based population model/ (99)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (344181)	
	11 exp medical decision making/ (51604)	
	12 exp practice guideline/ (225465)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (1633461)	
	14 (Cost# adj4 method#).m_titl. (33)	
	15 (Cost# adj4 data).m_titl. (41)	
	16 (Calculation adj2 cost).m_titl. (26)	
	17 14 or 15 or 16 (100)	
	18 13 and 17 (92)	
	19 limit 18 to (english language and humans and last 5 years) (19)	

Embase 1996 to 2011 Week 05	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (21344)	3
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (70572)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (344181)	
	4 economics/ or exp resource management/ (116878)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (234573)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (114078)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (1179158)	
	8 exp statistical model/ or exp uncertainty/ (68989)	
	9 individual based population model/ (99)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (344181)	
	11 exp medical decision making/ (51604)	
	12 exp practice guideline/ (225465)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (1633461)	

	14 (Resource adj3 calc#).m_titl. (0)	
	15 (Resource adj3 method).m_titl. (18)	
	16 resource data.m_titl. (2)	
	17 14 or 15 or 16 (20)	
	18 13 and 17 (10)	
	19 limit 18 to (human and english language and last 5 years) (3)	
Medline Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 10, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (26085)	2
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (76507)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (2165)	
	4 economics/ or exp resource management/ (25793)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (275530)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (261712)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (95361)	
	8 exp statistical model/ or exp uncertainty/ (188568)	
	9 individual based population model/ (0)	

	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (84039)	
	11 exp medical decision making/ (67738)	
	12 exp practice guideline/ (14798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (651077)	
	14 (Resource adj3 calc#).m_titl. (0)	
	15 (Resource adj3 method).m_titl. (18)	
	16 resource data.m_titl. (3)	
	17 14 or 15 or 16 (21)	
	18 13 and 17 (6)	
	19 limit 18 to (human and english language and last 5 years) (2)	
Embase 1996 to 2011 Week 05	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (21375)	10
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (70748)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (344728)	
	4 economics/ or exp resource management/ (116918)	

	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (234958)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (114262)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (1181654)	
	8 exp statistical model/ or exp uncertainty/ (69051)	
	9 individual based population model/ (99)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (344728)	
	11 exp medical decision making/ (51673)	
	12 exp practice guideline/ (225798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (1636690)	
	14 (Utility adj4 method).m_titl. (34)	
	15 (Calculat# adj4 utility).m_titl. (3)	
	16 "(quality of life) adj4 method#".m_titl. (0)	
	17 "Calculat# adj3 (quality of life)".m_titl. (0)	
	18 (utility adj4 method).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (1372)	
	19 (calculat# adj4 utility).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (23)	
	20 (quality of life adj4 method#).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (2923)	
	21 (calculat# adj3 quality of life).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (64)	
	22 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 (4375)	
	23 13 and 22 (3120)	
	24 limit 23 to (human and english language and last 5 years) (1203)	
	25 14 or 15 or 16 or 17 (37)	
	26 13 and 25 (10)	

Medline Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (26087)	10
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (76519)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (2165)	
	4 economics/ or exp resource management/ (25793)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (275530)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (261712)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (95361)	
	8 exp statistical model/ or exp uncertainty/ (188568)	
	9 individual based population model/ (0)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (84039)	
	11 exp medical decision making/ (67738)	
	12 exp practice guideline/ (14798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (651091)	

	14 (Utility adj4 method).m_titl. (39)	
	15 (Calculat# adj4 utility).m_titl. (2)	
	16 "(quality of life) adj4 method#".m_titl. (0)	
	17 "Calculat# adj3 (quality of life)".m_titl. (0)	
	18 (utility adj4 method).mp. [mp=protocol supplementary concept, rare disease supplementary concept, title, original title, abstract, name of substance word, subject heading word, unique identifier] (1600)	
	19 (calculat# adj4 utility).mp. [mp=protocol supplementary concept, rare disease supplementary concept, title, original title, abstract, name of substance word, subject heading word, unique identifier] (22)	
	20 (quality of life adj4 method#).mp. [mp=protocol supplementary concept, rare disease supplementary concept, title, original title, abstract, name of substance word, subject heading word, unique identifier] (521)	
	21 (calculat# adj3 quality of life).mp. [mp=protocol supplementary concept, rare disease supplementary concept, title, original title, abstract, name of substance word, subject heading word, unique identifier] (49)	
	22 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 (2187)	
	23 13 and 22 (696)	
	24 limit 23 to (human and english language and last 5 years) (200)	
	25 14 or 15 or 16 or 17 (41)	
	26 13 and 25 (10)	
Medline Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (26087)	6

<February 11, 2011>	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (76519)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (2165)	
	4 economics/ or exp resource management/ (25793)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (275530)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (261712)	
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	8 exp statistical model/ or exp uncertainty/ (188568)	
	9 individual based population model/ (0)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (84039)	
	11 exp medical decision making/ (67738)	
	12 exp practice guideline/ (14798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (651091)	
	14 (Uncertainty adj4 method).m_titl. (31)	
	15 (Calculat# adj4 uncertainty).m_titl. (0)	
	16 14 or 15 (31)	
	17 13 and 16 (20)	
	18 13 and 16 (20)	
	19 limit 18 to (english language and humans and last 5 years) (6)	

Embase 1996 to 2011 Week 05	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (21375)	5
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (70748)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (344728)	
	4 economics/ or exp resource management/ (116918)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (234958)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (114262)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (1181654)	
	8 exp statistical model/ or exp uncertainty/ (69051)	
	9 individual based population model/ (99)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (344728)	
	11 exp medical decision making/ (51673)	
	12 exp practice guideline/ (225798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (1636690)	

	14 (Uncertainty adj4 method).m_titl. (39)	
	15 (Calculat# adj4 uncertainty).m_titl. (1)	
	16 14 or 15 (40)	
	17 13 and 16 (22)	
	18 13 and 16 (22)	
	19 limit 18 to (english language and humans and last 5 years) (5)	
Medline Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (26087)	14
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (76519)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (2165)	
	4 economics/ or exp resource management/ (25793)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (275530)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (261712)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (95361)	
	8 exp statistical model/ or exp uncertainty/ (188568)	
	9 individual based population model/ (0)	

	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (84039)	
	11 exp medical decision making/ (67738)	
	12 exp practice guideline/ (14798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (651091)	
	14 "(sensitivity analysis) adj4 method#".m_titl. (0)	
	15 "(sensitivity analysis) adj4 type".m_titl. (0)	
	16 (sensitivity analysis adj4 type).mp. [mp=protocol supplementary concept, rare disease supplementary concept, title, original title, abstract, name of substance word, subject heading word, unique identifier] (15)	
	17 (sensitivity analysis adj4 method#).mp. [mp=protocol supplementary concept, rare disease supplementary concept, title, original title, abstract, name of substance word, subject heading word, unique identifier] (91)	
	18 14 or 15 or 16 or 17 (106)	
	19 13 and 18 (72)	
	20 limit 19 to (english language and humans and last 5 years) (14)	
Embase 1996 to 2011 Week 05	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (21375)	11

	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (70748)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (344728)	
	4 economics/ or exp resource management/ (116918)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (234958)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (114262)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (1181654)	
	8 exp statistical model/ or exp uncertainty/ (69051)	
	9 individual based population model/ (99)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (344728)	
	11 exp medical decision making/ (51673)	
	12 exp practice guideline/ (225798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (1636690)	
	14 "(sensitivity analysis) adj4 method#".m_titl. (0)	
	15 "(sensitivity analysis) adj4 type".m_titl. (0)	
	16 (sensitivity analysis adj4 type).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (13)	
	17 (sensitivity analysis adj4 method#).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (96)	
	18 14 or 15 or 16 or 17 (109)	
	19 13 and 18 (80)	

	20 limit 19 to (english language and humans and last 5 years) (11)	
Embase 1996 to 2011 Week 05	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (21375)	2
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (70748)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (344728)	
	4 economics/ or exp resource management/ (116918)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (234958)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (114262)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (1181654)	
	8 exp statistical model/ or exp uncertainty/ (69051)	
	9 individual based population model/ (99)	
	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (344728)	
	11 exp medical decision making/ (51673)	
	12 exp practice guideline/ (225798)	

	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (1636690)	
	14 (statistic# adj4 method#).m_titl. (27)	
	15 (statistic# adj4 data).m_titl. (127)	
	16 14 or 15 (153)	
	17 13 and 16 (40)	
	18 limit 17 to (human and english language and last 5 years) (2)	
Medline Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (26087)	6
	2 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ab. (76519)	
	3 exp health economics/ or exp economic evaluation/ or exp pharmacoeconomics/ (2165)	
	4 economics/ or exp resource management/ (25793)	
	5 exp disease model/ or disease simulation/ or exp computer model/ or exp statistical model/ or exp stochastic model/ or exp simulation/ (275530)	
	6 mathematical model/ or exp statistical model/ or exp stochastic model/ (261712)	
	7 population model/ or exp disease management/ or exp economic evaluation/ or exp pharmacoeconomics/ or exp "quality of life"/ (95361)	
	8 exp statistical model/ or exp uncertainty/ (188568)	
	9 individual based population model/ (0)	

	10 exp health economics/ or exp economic evaluation/ or exp "cost benefit analysis"/ or exp "cost control"/ or exp "cost effectiveness analysis"/ or exp "cost minimization analysis"/ or exp "cost of illness"/ or exp "cost utility analysis"/ (84039)	
	11 exp medical decision making/ (67738)	
	12 exp practice guideline/ (14798)	
	13 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (651091)	
	14 (statistic# adj4 method#).m_titl. (78)	
	15 (statistic# adj4 data).m_titl. (200)	
	16 14 or 15 (277)	
	17 13 and 16 (31)	
	18 limit 17 to (human and english language and last 5 years) (6)	
Embase 1996 to 2011 Week 05	1 ((computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*) adj4 ethics).m_titl. (13)	4
	2 ((computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*) adj equity).m_titl. (0)	

	3 ((computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*) adj4 ethic#).m_titl. (13)	
	4 1 or 2 or 3 (13)	
	5 limit 4 to (english language and humans and last 5 years) (4)	
MedlineOvid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2011>	1 ((computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*) adj4 ethics).m_titl. (17)	3
	2 ((computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*) adj equity).m_titl. (0)	

	3 ((computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*) adj4 ethic#).m_titl. (17)	
	4 1 or 2 or 3 (17)	
	5 limit 4 to (english language and humans and last 5 years) (3)	
EMBASE <1996 to 2011 Week 06>, Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (47462)	13
	2 (scope or perspective or population or comparator or time horizon or transparent or transparency or reproducible or reproducibility or robustness or parsimony or timeliness).m_titl. (276870)	
	3 method#.m_titl. (143232)	
	4 type.m_titl. (380930)	
	5 3 or 4 (523494)	
	6 1 and 2 and 5 (30)	
	7 limit 6 to english language (27)	
	8 limit 7 to human (22)	
	9 limit 8 to last 5 years (13)	

EMBASE <1996 to 2011 Week 06>, Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (47462)	11
	2 method#.m_titl. (143232)	
	3 type.m_titl. (380930)	
	4 (literature or evidence).m_titl. (343777)	
	5 2 or 3 (523494)	
	6 1 and 4 and 5 (20)	
	7 limit 6 to english language (20)	
	8 limit 7 to human (15)	
	9 limit 8 to last 5 years (11)	
EMBASE <1996 to 2011 Week 06>, Ovid MEDLINE(R) <1948 to February week 1 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2011>	1 (computer simulation model* or computer* model* or cost analys* or cost* model* or cost utilit* or cost effectiveness or crystal ball or decision method* or decision tool or decision analysis or decision analytic* or decision data or decision model* or decision tree* or decision triage or economic* analysis or economic* simulation or economic* report* or econometric model* or economic* model* or economic* method* or health technology assessment* or health economic model or outcome analysis or outcome assessment or pharmacoeconomic* model* or pharmaco economic or Markov model* or Markov simulat* or math* model* or patient level simulat* or patient-level simulate* or patient* model or monte carlo simulat* or montecarlo* model* or monte carlo model or bayesian simulat* or bayesian model*).ti. (47462)	26
	2 method#.m_titl. (143232)	
	3 (model# structure or model# approach or assumption$ or cycle lengh).mp. or half?cycle.m_titl. [mp=ti, ab, sh, hw, tn, ot, dm, mf, ps, rs, nm, an, ui] (105344)	
	4 approach.m_titl. (187204)	
	5 2 or 4 (329707)	
	6 1 and 3 and 5 (75)	

	7 limit 6 to english language (74)	
	8 limit 7 to humans (55)	
	9 limit 8 to last 5 years (26)	

5 Summary of Changes Made to the Guide at Consensus (Rounds 1 & 2)

The following tasks were taken from round 1 to round 2 and after consensus discussion (round 2) no changes were made.		
Disease Context	Describe the natural history and/or progression of the disease and show at which stage the intervention is used.	Phase 1
Overall Patient Population	Describe the overall patient population for which the intervention will be used.	Phase 2
Overall Patient Population - Selection Criteria	Define the diagnostic or other criteria used to determine the use of the intervention in the "overall patient population" (P6).	Phase 2
Overall Patient Population - Selection Method	Describe the existing and/or future (proposed) methods for determining the criteria named in "overall patient population - selection criteria" (P7).	Phase 2
Subgroup Patient Population	Describe any subgroup patient population for which the intervention will be used and justify the need for a subgroup analysis.	Phase 2
Subgroup Patient Population - Selection Criteria	Define the diagnostic or other criteria used to determine the use of the intervention in the "subgroup patient population" (P8).	Phase 2
Subgroup Patient Population - Selection Method	Describe the existing and/or future (proposed) methods for determining the criteria named in "subgroup patient population - selection criteria" (P9).	Phase 2
Methodological Uncertainty	Document, graph and justify the methods used to quantify the methodological uncertainty potentially arising from the components identified in the uncertainty identifier column.	Phase 4
Heterogeneity	Describe steps taken to address the heterogeneity potentially arising from the components identified in the other identifier column.	Phase 4
The following tasks were taken from round 1 to round 2 and after consensus discussion (round 2) they were removed from the draft version of the Beginner's Guide.		
Mortality Data	Describe the source and methods used to incorporate mortality data.	Phase 3
Net Monetary Benefit	Document the net monetary benefit for the intervention and each comparator.	Phase 5

Net Monetary Benefit - Graph	Graph the net monetary benefit value against the value of the ceiling ratio or willingness to pay threshold (λ).	Phase 5
Net Monetary Benefit - Confidence Interval	State, describe the method and graph the confidence interval for the net monetary benefit (I16).	Phase 5
The following tasks were taken from round 1 to round 2 and after consensus discussion (round 2) they were added to the draft Beginner's Guide.		
Model Purpose	Describe the purpose of the model	Phase 1
Direct medical (diagnostic tests, drug costs, supplies, healthcare personnel, medical facilities, cost of adverse events)	Tabulate direct medical costs and sources used	Phase 3
Direct non-medical (childcare, pt transport, dietary requirements; carers; pt travel, waiting times costs)	Tabulate direct non-medical costs and sources used	Phase 3
Cost Data - Productivity Loss	If a societal perspective has been adopted, describe and justify the method used to value productivity loss in the model.	Phase 3
Cost Data - Transfer Costs	Describe the methods used to include transfer costs.	Phase 3
Cost Data - Indirect Costs	Describe the methods used to include indirect costs, and justify their inclusion in the model.	Phase 3
Cost Data - Future Costs	Describe the methods used to value future costs, and justify the inclusion in the model.	Phase 3
Matching Cost and Outcome Data Over time	Document that cost and outcome data have been matched over time.	Phase 3
Resource Parameters - Distributions	State and justify the distribution assigned to the resource parameters.	Phase 3
Model Output	State the planned model output	Phase 2
Data Availability	Describe whether the available data addresses the potential structure of the model	Phase 2
Preliminary Results	Run the model to determine the preliminary results.	Phase 3
The following tasks were taken from round 1 to round 2 and after consensus discussion (round 2) they were reworded in the draft version of the Beginner's Guide.		
Comparator Context	List all known comparator interventions in current practice and/or future practice and consider the extent to which each of these are relevant to the decision problem.	Phase 1
Patient Sample Parameters - ~~Regression~~ Models	State and justify ~~regression~~ models assigned to patient sample parameters.	Phase 3
Cost Parameters - ~~Regression~~ Models	Describe and justify ~~regression~~ models assigned to cost parameters.	Phase 3

Clinical Outcome Parameters - ~~Regression~~ Models	Describe and justify ~~regression~~ models assigned to clinical outcome parameters.	Phase 3
Utility Parameters - ~~Regression~~ Models	Describe and justify ~~regression~~ models assigned to utility parameters.	Phase 3

6 Researcher Validation of the Completeness of the Beginner's Guide.

The following table summarises the steps taken to re-develop the model, whether it was captured in the guide and the reference of where it was captured in the guide.

Model Tasks (Researcher validation) (not in order of model development)	**Captured in Guide? Y=yes, N=no;**	**Relevant Component in the Guide (where applicable)**	**Proposed change***
Decide on model structure (dictated in this exercise by EECP model otherwise not comparable)	Y	Model Structure (Co3); Model Structure (I1)	None
Make assumptions about model structure	Y	Model Structure - Assumptions (I2)	None
Convert the probability of top up for yr 2 to a rate to apply for subsequent years as per Briggs et al. 2006	Y	Resource Use Data (I19); Resource Use Data - Excluded (I20); Resource Use Data - Missing (I21); Resource Use Data - Assumptions (I23);Resource Parameters - Distributions (I22)	None
Decide whether outcomes will be discounted	Y	Utility Parameters - Discounting (I70)	None
Decide discount rate for outcomes	Y	Utility Parameters - Discounting (I70)	None
Derive baseline utility	Y	Utility Data (I59)	None
Make assumptions about baseline utility	Y	Utility Parameters - Assumptions (I69)	None

Model Tasks (Researcher validation) (not in order of model development)	**Captured in Guide? Y=yes, N=no;**	**Relevant Component in the Guide (where applicable)**	**Proposed change***
Incorporate uncertainty in the baseline utility into the model	Y	Uncertainty identifier column	None
Apply relevant distributions	Y	Patient Sample Parameters - Distributions (I9); Resource Parameters - Distributions (I22); State and justify the distribution assigned to the cost parameters. (I32); Clinical Outcome Parameters - Distributions (I48); Utility Parameters - Distributions (I62); Relative Risk Parameters - Distributions (I80).	None
Decide whether costs will be discounted	Y	Cost Data - Discounting (I30)	None
Decide discount rate for costs	Y	Cost Data - Discounting (I30)	None
Calculate staff costs	Y	Cost Data (I24)	None
Adjust costs to current year	Y	Cost Data - Original Year (I26)	None
Perform check on columns (additive, total numbers etc.)	Y	Model Checking Module and identifier columns	None
Run PSA	Y	Uncertainty components in the Checking module and uncertainty identifier column	None
Generate CEAC, EVOI	Y	Module 5 Storage of Analyses and Results (E13); Model Results (E14)	None

Model Tasks (Researcher validation) (not in order of model development)	Captured in Guide? Y=yes, N=no;	Relevant Component in the Guide (where applicable)	Proposed change*
Identifying resources	Y	Resource Use Data (I19); Resource Use Data - Excluded (I20); Resource Utilisation Data - Missing (I21); Resource Utilisation Data - Assumptions (I23);Resource Parameters - Distributions (I22)	None
Quantifying resource use	Y	Resource Use Data (I19); Resource Use Data - Excluded (I20); Resource Use Data - Missing (I21); Resource Use Data - Assumptions (I23);Resource Parameters - Distributions (I22)	None
Valuing resources	Y	Cost Data (I24)	None
Convert raw to usable data (raw SF36 values)	Y	Utility Data (I59); Utility Data - Missing (I60); Utility Parameters - Point Estimates (I61);Utility Parameters - Distributions (I62); Utility Parameters -Models (I63); Utility Parameters - Secondary Data (I64); Utility Parameters - Pooled Estimates (I65); Utility Parameters - Other Methods (I66); Utility Parameters - Correlation (I67); Utility	None

Model Tasks (Researcher validation) (not in order of model development)	Captured in Guide? Y=yes, N=no;	Relevant Component in the Guide (where applicable)	Proposed change*
		Parameters - Extrapolation (I68); Utility Parameters - Assumptions (I69).	
Calculate the probability of requiring top-ups (Raw data - have the percentage of people requiring top up at day 378 ie 18%. We have the sample size (proportion) and can use it to calculate alpha and beta)	Y	Resource Use Data (I19); Resource Use Data - Excluded (I20); Resource Use Data - Missing (I21); Resource Use Data - Assumptions (I23);Resource Parameters - Distributions (I22)	None
Map SF36 Arora to EQ5D	Y	Mapping -Generic Non-preference to Generic Preference-based (I76) Mapping - Condition-Specific non-preference to Generic Preference-based Index (I77)	None
Apply equations set out in Briggs, to calculate the alpha and beta values (given mean and SE) for parameters	Y	Patient Sample Parameters - Distributions (I9); Resource Parameters - Distributions (I22); State and justify the distribution assigned to the cost parameters. (I32); Clinical Outcome Parameters - Distributions (I48); Utility	None

Model Tasks (Researcher validation) (not in order of model development)	Captured in Guide? Y=yes, N=no;	Relevant Component in the Guide (where applicable)	Proposed change*
		Parameters - Distributions (I62); Relative Risk Parameters - Distributions (I80).	
Decide on number of model iterations	N		None, specific to Markov models
Calculate probabilities	N	Interval Probabilities to Instantaneous Rates (I79); Relative Risk Parameters - Distributions (I80); Time to Event Data - Survival Analysis (I81).	None, specific to Markov models
At year 1 - assume all patients have average response to tx	N	Clinical Outcome Parameters - Assumptions (I55)	None, specific to Markov models
At year 2 - some pts have sustained response (responders)(dependent on top up tx), others do not have sustained response (non-responder) and some die due to CV events and all-cause mortality	N	Clinical Outcome Parameters - Assumptions (I55)	None, specific to Markov models
Name cells - excel specific issue	N		None, specific to excel software
Decide if model will be probabilistic and or deterministic	N		Add to module 1
Obtain baseline mortality risk equations	N	Time to Event Data - Survival Analysis (I81)	Add "Have baseline risk equations been used?"
Match baseline risk equations to trial population or make assumptions	N	Time to Event Data - Survival Analysis (I81)	If yes which baseline patient characteristics have been used (e.g. match the trial)

Model Tasks (Researcher validation) (not in order of model development)	Captured in Guide? Y=yes, N=no;	Relevant Component in the Guide (where applicable)	Proposed change*
Obtain estimates of all-cause mortality (e.g. lifetables)	N	Time to Event Data - Survival Analysis (I81)	Add "Has all-cause mortality been considered?"
Adjust all-cause mortality with additional risk	N	Time to Event Data - Survival Analysis (I81)	Consider if it is necessary to adjust all-cause mortality for any additional risk.
Record the methods used for the step above	N	Time to Event Data - Survival Analysis (I81)	If yes above, what methods have been used?
Incorporate uncertainty in mortality into the model	N	Time to Event Data - Survival Analysis (I81)	How has uncertainty in the mortality estimates been incorporated in the model?
Calculate change from baseline for utilities	N		Add a component that includes the conversion of raw to usable data for each parameter
Expert elicitation used to ascertain whether QOL benefit is sustained after 1 yr	N		Add a component that includes the conversion of raw to usable data for each parameter
Calculate final values (analysis of expert elicitation) for the model using stats package R	N		Add a component that includes the conversion of raw to usable data for each parameter
Program the model	N		None, implicit
Consult statistician or similar	N		Consult statistician

* Note that the changes were proposed but not yet implemented in the final version of the BG shown in Appendix 1.