estimated opportunity loss due to uncertainty, compared with the situation in which the evidence was synthesized using traditional pairwise meta-analysis. The nominal value of EVPIs varied considerably between the two schemes, with potential to have an impact on the justifiability and the optimal sample size of the future RCT.

PRM79

MARKOV MODELS WITH DIFFERENT HEALTH-STATES FOR ADVANCED BREAST CANCER: A SIMULATION STUDY OF LAPATINB

Le QA

Western University of Health Sciences, Pomona, CA, USA

OBJECTIVES: In cost-effectiveness literature, several Markov models with different health states and assumptions are used to estimate cost-effectiveness for treatment of advanced breast cancer (ABC). This study aims to (1) derive the relationships among the Markov models for ABC, and (2) examine the impact of using different Markov models on cost-effectiveness results for treatment of HER2-positive advanced breast cancer. **METHODS:** There are four Markov models for ABC: (i) model 1 includes 4 health states (stable, response, progression, and dead) with a possibility of death can occur in all health states; (ii) model 2 also consists of 4 health states but the chance of dying can only occur at disease-progression state; (iii) model 3 is the most common model and has 3 health states (stable, progression, and dead) with a possibility of death can occur in all health states; and (iv) model 4 also has 3 health states but the chance of death can only occur at disease-progression state. Relationships of transition probabilities among the Markov models were derived. A simulation method was used to generate 10,000 samples with transition probabilities, estimated costs and utilities for each health state based on a previously published cost-effectiveness study of lapatinib in treatment of HER2-positive advanced breast cancer. **RESULTS:** Markov models 2 and 4 yielded similar and lowest incremental cost-effectiveness ratios (ICER), while the commonly used Markov model (model 3) produced the highest ICER. All four Markov models produced ICERs > $150,000 per additional quality-adjusted life year gained for the combination therapy with lapatinib as compared to monotherapy with capecitabine. **CONCLUSIONS:** This study suggests that modeling advanced breast cancer with different health-state Markov models may produce different cost-effectiveness results. Combination therapy with lapatinib in treatment of HER2-positive advanced breast cancer is not a cost-effective treatment strategy regardless which Markov models used.

PRM80

MODELING DIABETES COSTS: A COMPARISON OF ECONOMETRIC METHODS USING SIMULATED ERROR DISTRIBUTIONS

Schwartz EL, Hay J

University of Southern California, Los Angeles, CA, USA

OBJECTIVES: Economic modeling and health care cost analyses are used to inform policy-makers in health care decision-making such as cost-of-illness assessments, treatment evaluation studies, and more commonly to predict health care costs for specific patient populations. However, due to stochastic error distribution assumptions and the challenges they create for econometric modeling, various types of models have been identified to address specific distributional characteristics. The objective of study is to examine cost distributions for treated diabetes patients and compare untransformed ordinary least squares (OLS) regression with log transformed OLS and generalized linear model (GLM) methods. **METHODS:** A simulated distribution was created mirroring a representative claims dataset for type 2 diabetes costs. Using simulated cost distributions with known error term ensures that model selection could be assessed with certainty of the error specification for the distribution. Two simulated cost distributions were generated: one with homoskedastic errors and the other with heteroskedastic errors. Both distributions were used to explore model performance under varying conditions. Several tests for model fit, specification, and predictive ability were selected from the existing literature to assess model selection and determine best model fit. Simulation and all analyses were done using STATA 11. **RESULTS:** Results from the model specification tests indicate that for both cost error distributions, OLS regression on untransformed Y is the best-fitting model of the three tested. Although superior in model fit, prediction criteria indicate that OLS is relatively poor in prediction along the entire range of costs. **CONCLUSIONS:** OLS on untransformed Y cost model is selected as the best model choice under the conditions of the given distributions. The inability for all three models to predict within the full range of costs demonstrates weakness in characterizing the upper tail of the distribution. If prediction is the primary concern, a two-part model may be more appropriate.

PRM81

CAN WE DETERMINE THE OPTIMAL CYCLE LENGTH FOR WHICH HALF-CYCLE CORRECTION SHOULD ALWAYS BE APPLIED?

Drzal R, Szmurlo D, Plisko R

HTA Consulting, Krakow, Poland

OBJECTIVES: When modeling long-term costs and health effects using Markov models, choosing the time of transition to another state (progression of the disease) seems to influence the final results. Various approaches can be adopted, i.e. transitions at the beginning, at the end or in the middle of the cycle. Our aim is to measure influence of cycle length and progression rates on differences between final results obtained using those methods and to establish whether there is an optimal cycle length for which half cycle correction (HCC) should always be applied. **METHODS:** A simple, hypothetical, two-state Markov model was built. The time horizon was set to be lifetime, an outcome discount rate was 0% or 5% and costs/utilities were held constant in time. Assuming different progression rates (0.05–0.90 annually), three methods were compared: transitions at the beginning of the cycle ('beginning'), at the end of the cycle ('end'), in the middle of the cycle (HCC). For each parameter the threshold values were determined, i.e. the maximal cycle length for which the difference between half-cycle correction and 'beginning'/'end' methods were not greater than 5%. We assumed that cycles longer than the estimated threshold will imply the application of HCC. **RESULTS:** For 5% discount rate the threshold cycle length was 1 year for annual progression of 0.05 and it became shorter for lower progression rates (2 weeks for 0.90 progression rate). Assuming no discounting, the threshold was 2 years for annual progression of 0.05 and 2 weeks for progression of 0.90. **CONCLUSIONS:** Choice of the time of transitions in the model may have a significant impact on results. For cycles shorter than 2 weeks HCC does not seem to be necessary, however it should always be applied for cycles longer than 1 year. For cycles between 2 weeks and 1 year a general recommendation cannot be made.

PRM82

THE VALUE OF VALUE IN HEALTH ECONOMIC MODELLING

Jeppsson K[1], Carlqvist P[2]

[1]*HERON Evidence Development Ltd, Luton, UK,* [2]*Heron AB, Stockholm, Sweden*

OBJECTIVES: Health Technology Assessment (HTA) has during the last decades become an increasingly important tool for the introduction of new health care interventions. The aim of HTA is to assist payers in making informed decisions about allocating resources in the health care system. The use of decision-analytic modelling (DAM) to aid HTA represents an explicit approach to synthesizing available evidence and provides support in reimbursement decisions under conditions of uncertainties. Probabilistic sensitivity analysis (PSA) is generally viewed as the most appropriate method of handling parameter uncertainty as it provides assessment of the joint effect of uncertainty over all ingoing parameters. It also facilitates value-of-information analysis that can quantify the implications of decision uncertainty explicitly and investigate the value of further studies. The objective of this study is to explore the value given to probabilistic decision modelling in the context of health technology assessment in England and Scandinavia. **METHODS:** A systematic search was undertaken to identify the current guidelines of the HTA bodies in England and Scandinavia (Sweden, Norway, and Denmark), specifically extracting all information relating to approaches of assessing uncertainties in DAM and the request for probabilistic analysis (e.g. incremental net benefit (INB) analysis or expected-value-of-perfect-information methods (EVP(P)I). **RESULTS:** All the reviewed HTA agencies and reimbursement authorities require deterministic sensitivity analysis for primary assumptions whereas only two agencies specifically require an addition of a PSA. The guidelines from the National Institute for health and Clinical Excellence (NICE) in the UK express strong support of conducting PSA, but have no requirements for the inclusion of EVP(P)I. The Norwegian Medicines Agency (NoMA) guidelines mentions both INB analysis and EVP(P)I. The remaining countries have no specific requirements regarding probabilistic modelling at all. **CONCLUSIONS:** The recent inclusion recommendations of INB and EVP(P)I in Norway indicate a growing recognition of the value of probabilistic analysis.

PRM83

A REVIEW ON INDIVIDUAL SIMULATION (ILS) METHOD USED IN NICE ECONOMIC EVALUATIONS FOR RECENT ONCOLOGY MEDICINES

He J[1], Zhao W[2]

[1]*Janssen Global Services LLC, Raritan, NJ, USA,* [2]*Columbia University, New York, NY, USA*

OBJECTIVES: Unlike modeling chronic diseases such as diabetes, ILS for oncology drugs health technology assessment (HTA) is rare because of short treatment duration, simple disease states and treatment pathways. With new drugs filling the space of mild symptomatic or asymptomatic cancer patients, researchers start to embrace the method of ILS because it can better predict survival and other events by individual patient tracking, and simulate trials and real world clinical practice. It has not been widely endorsed by HTA payers due to lack of simplicity and transparency. The objective of this study is to review and catalog different modeling methods used in NICE submissions for advanced/metastatic cancer treatments, understand when NICE is looking for ILS. **METHODS:** A targeted search of NICE website found 68 NICE rulings happened between 2000 and 2012 for oncology drugs. We extracted information on the model used, the application setting, the method and data used to model cancer evolution. **RESULTS:** Survival trees and Markov cohort models were most commonly employed. Simulation methods evolved from simple decision trees to more complex Markov models over the last decade. ILS model was submitted to NICE for decision making by manufacturers. NICE stated that it would accept the discrete event simulation model, a type of ILS, if manufacturer made a well justified case. When multiple treatments and/or patient heterogeneity exist, and such complexity influences cost and health outcomes, NICE encouraged the method of ILS. For example, ILS was suggested in modeling the first line maintenance of Rituximab in treating the stage III-IV follicular lymphoma and first line treatment of Imatinib in treating metastatic gastro-intestinal stromal tumors. **CONCLUSIONS:** ILS emerges as a modeling method for cancer treatment because it provides a framework for natural representation of disease and resource use. Although it is a more sophisticated approach, some HTAs like NICE start to support this method.

PRM84

ACCOUNTING FOR PARTIAL RESPONDERS IN COST-EFFECTIVENESS MODELING OF BIOLOGICS FOR PSORIASIS

Sikirica S

Thomas Jefferson University, Philadelphia, PA, USA