PRM29

COMPARISON OF DISCRETE DISCOUNTING AND NON-CONSTANT EXPONENTIAL DISCOUNTING APPROACHES TO CALCUATE FUTURE GAINS IN QUALITY-ADJUSTED LIFE-YEARS

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OBJECTIVES: Several large scale surveys conducted to measure time-preferences of people in various fields, other than those in the health outcomes, have shown that time-preferences follow non-constant exponential discounting. In pharmacoeconomic studies, however, all outcomes measures including quality-adjusted life-years (QALYs) use discrete discounting. Disability-adjusted life-years (DALYs) is an exception that is discounted using the non-constant exponential discounting approach. The objective of this study is to review the current literature on time-preferences specific to health outcomes and compare the differences between QALYs obtained through discrete discounting and non-constant exponential discounting approaches. **METHODS:** We searched PubMed and EconLit for methodological studies examining time-preferences specific to health outcomes. We projected gains of 0.1 QALY/person/year over 1 to 75 years in a hypothetical dataset of 1000 persons. We calculated differences in present values of QALYs obtained through discrete discounting and non-constant exponential discounting approaches, i.e. QALYs from discrete discounting subtracted by QALYs from non-constant exponential discounting, at discount rates of 1.5%, 3%, 5%, and 7%, from 1 to 75 years. **RESULTS:** We found no studies that examined discounting approaches specific to health outcomes. The differences in present values of QALYs, at 25, 50, and 75 years, respectively, were: 1) 0.28%, 0.55%, and 0.83%, using a 1.5% discount rate; 2) 1.1%, 2.2%, and 3.3%, using a 3% discount rate; 3) 3%, 5.9%, and 8.7%, using a 5% discount rate; and 4) 5.7%, 11.1%, and 16.1%, using a 7% discount rate. **CONCLUSIONS:** We found no published research comparing discrete discounting to non-constant exponential discounting approaches for QALYs. Over long time horizons, we found small but conceptually important differences between QALYs estimated by these approaches. Therefore, we recommend future studies to address time-preferences specific to determine if non-constant exponential discounting is relevant to health outcomes such as QALYs.

PRM30

A MODEL TO PREDICT RISK OF NON-ADHERENCE TO MEDICATIONS HIGHLIGHTED IN CMS STAR-RATINGS

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OBJECTIVES: The Center for Medicaid and Medicare Services (CMS) has created plan Star ratings that indicate the quality of Medicare plans. In 2012, CMS added three pharmacy measures that focus on member medication adherence, i.e. oral diabetes medications, hypertension medication (ACEI or ARB), and cholesterol medication (statins). To proactively identify patients at risk for non-adherence, a multi-variate regression prediction model was developed to create individual persistency risk scores. **METHODS:** The predictive model is created using prescription drug and medical claims from a large managed care database. Medicare and commercially insured patients over age 55 from 2008-2010 who are new to the Star rating medication categories are included. Patients included in the model have a full 18 months of continuous enrollment in the health plan (6 month drug naïve period, 12 months of follow up). The predictors are created from the 6 month pre period and include: a) socio-economic factors; b) medical characteristics (e.g. Charlson Comorbidity Index); and c) drug characteristics (i.e. drug cost and past chronic drug adherence). **RESULTS:** Multivariable analysis of study outcomes will be conducted using appropriate regression models based on the distribution of the measure. A logistic regression model will be estimated (=1 for at least 80% PDC, =0 for non-compliance). Results of a logistic regression will be presented as odds ratios associated with each independent variable. The parameter estimates from the above econometric model will be retained and used to estimate the probability of non-compliance on a new set of patients. To test the accuracy of the predictive model, we will choose a random sample of patients new to these medications in 2011, as exhibited by the average PDC in each risk group (high, medium, low). **CONCLUSIONS:** An adherence predictive model can be useful to identify patients who may benefit from a drug adherence intervention program.

PRM31

EVALUATION OF DECISION ANALYTIC MODELS IN COST-EFFECTIVENESS ANALYSIS IN KOREA: FROM GUIDELINE TO PRACTICE

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OBJECTIVES: Korea's Health Insurance Review and Assessment Service (HIRA) has been in charge of formulating economic evaluation guideline and evaluating submissions for reimbursement decision. The purpose of this study is to observe current practice patterns of using decision analytic models in submissions considered by HIRA. **METHODS:** Thirty-four dossiers were submitted by industry from January 2007 until December 2009, and they were evaluated by two independent researchers at HIRA. The adherence to current HIRA's recommendation was assessed. **RESULTS:** Out of 34 submissions, 23 applied model-based evaluations, and more than half (14) submissions were based on markov modeling. Dynamic models were not applied any of the submissions. Submissions frequently omitted the justification of the assumptions, definition of markov states or cycle length. Parameter search /selection criteria were rarely provided, and usually extrapolated in favor of the applicants. Transparency was lacking especially models with long time horizon and multiple assumptions, and submitted models were rarely validated. **CONCLUSIONS:** Decision analytic models are frequently applied in economic evaluation dossiers, yet the quality of provided models varied greatly. Revised HIRA's guideline could specify the minimum standard of modeling to increase the comparability of submitted dossiers.

PRM32

ONE DAY MONEY WILL ONLY BE SPENT ON EFFECTIVE DRUGS. . .FROM PAYERS' ASPIRATIONS TO PERFORMANCE-BASED RISK-SHARING OPERATIONS

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OBJECTIVES: To define an operational modelling framework intended to help the design of Performance-Based Risk-Sharing (PBRS) schemes. A time-to-event endpoint is used as a performance criterion. Such survival endpoints are commonly used in clinical studies, notably in oncology where PBRS schemes are gaining momentum. **METHODS:** The framework is based on an open population model with a monthly cycle and 3-year time horizon from launch (i.e. when enrolment into the PBRS scheme starts). Entry into the model (i.e. the progressive arrival of new patients into the PBRS scheme) is determined by market diffusion assumptions and is modelled using a Logistic function. Exit from the model (i.e. patients experiencing the event or dying from any cause) is determined by survival curves from clinical/epidemiological studies and is modelled using a Weibull function. The model accommodates different treatment dosing schedules and performance levels (i.e. minimum survival times guaranteed). Multiple PBRS scenarios can be run and compared in terms of their operational and financial implications. Additionally, the effect of potential revisions of a PBRS scheme terms and conditions can also be examined as real-life information becomes available following scheme implementation (i.e. Bayesian updating). **RESULTS:** For example, assuming 1,000 patients enrolled in a PBRS scheme, with a monthly dosing schedule and given diffusion (Logistic α=5.0; β=0.4) and survival (Weibull λ=0.7; k=27.0) assumptions, the model predicts that 1937 (6970), 4050 (7861) and 9282 (4420) doses will be given to non-responding (responding) patients with 12, 18 and 24 months minimum survival time guaranteed scenarios, respectively. **CONCLUSIONS:** This framework provides both payer and manufacturer with valuable insight into the operational and financial dimensions of the potential PBRS schemes they may contemplate as they negotiate patient access conditions. Both parties can better anticipate the implications of the schemes and better plan resources, logistics and financial arrangements accordingly.

PRM33

VALIDATING A WEB-BASED, INCREMENTAL COST-EFFECTIVENESS SOFTWARE PROGRAM THAT IMPLEMENTS A MARKOV CHAIN MONTE CARLO (MCMC) ANALYSIS MODEL

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OBJECTIVES: To evaluate a web-based software program which incorporates Markov Chain Monte Carlo (MCMC) analysis to compare the cost-effectiveness of any two treatments, allowing modifiable inputs of key variables. **METHODS:** A web-based software program was developed, which incorporates Markov Chain Monte Carlo (MCMC) analysis to compare the cost-effectiveness of any two treatments. The online software program was based on calculation methods described in "Decision Making in Health and Medicine" textbook from Hunink et al. The MCMC web-based program computes and graphically displays the results, using JavaScript algorithms and is available as freeware at www.healthstrategy.com. We compared the online results with analyses using Decision Maker software available from UMDNJ.edu. The variable inputs that can be modified in the web-based application include: state transition probabilities, number of patients, number of cycles, cost per state, and utility per state. **RESULTS:** The web-based tool creates plots of incremental costs versus incremental utilities, in cost-effectiveness quadrants; and if death is the absorbing state, also graphs life expectancy curves for two treatment comparisons. As an example of the similarity of findings, when considering three transition states per treatment, the online software versus the Decision Maker model results were as follows: treatment cost (means: $1417 vs. $1300 and standard deviations: 1706 vs. 1604); treatment effectiveness (means: 7.6 vs. 7.8 and standard deviations: 7.2 vs. 7.0). **CONCLUSIONS:** With this online MCMC program, the user can input their own therapy parameters, and then generate key means and standard deviations, incremental costs, incremental utilities, life expectancy curves, and incremental cost effectiveness ratios. MCMC has advantages over Markov cohort analyses because means and standard deviations can be generated from the MCMC calculations. This web-based application has potential benefit as a basic educational tool for students and health professionals interested in exploring these analytical approaches.

PRM34

ESTIMATING MARKOV CHAIN TRANSITION MATRICES IN LIMITED DATA SAMPLES: A MONTE CARLO EXPERIMENT

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OBJECTIVES: Markov models are often used in Health Economics to represent disease progression in Cost-Utility models. The transition probabilities, however, may be difficult to populate when the data are limited. This note applies the Markov matrix approximation method using vector autoregression (VAR) to estimate the transition matrix when the sample size is small. **METHODS:** We compare the performance of the standard (count) method versus the VAR method to estimate transition probabilities in small samples. For the count method, one counts the