one state to another. Depending on the purpose, the color of the parallellograms indicates the categories of a chosen cycle or could refer to additional attributes of the patient’s health state. RESULTS: State probability and survival curves merely show specific aggregates of the data while classic Markov trace visualizations with, for example bubble diagrams do not visualize data in a sense that would facilitate a detection of proportions and trends. Applying Parallel Sets to analyze Markov models for different clinical visualizations referring the reference Markov cycle is as easy as highlighting particular dimensions, thus enabling the exploration of the progress of patient cohorts with certain characteristics through the model. CONCLUSIONS: Model development always requires thorough analysis of its structure, behavior and results. Parallel Sets enable an intuitive and efficient visualization technique for presentation purposes as well as exploratory analysis.

PMR7 A TREATMENT SEQUENCE APPROACH FOR MODELLING CROHN’S DISEASE
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OBJECTIVES: Crohn’s disease (CD) is a relapsing remitting inflammatory disease affecting the gastrointestinal tract. Previous economic evaluations in CD have focussed on single treatment comparisons within the treatment pathway. This project aimed to develop a model capturing lifetime costs and utilities throughout the entire treatment path. METHODS: A treatment sequence model was adapted from an earlier CD model by including the option to change treatments at patients stopping responding. A Markov structure was used with five health-states: full, partial- and no-response, surgery and death. Transition probabilities and survival rates were derived from previous analyses with separate transition matrices used for standard care and anti-TNF-α. The model allows for ≤11 treatment stages (each with induction and maintenance phases) to be evaluated. Patients failing in induction progress to the next stage, if failing in maintenance they return to the induction treatment from that stage unless it is the same as the maintenance treatment. Surgery can be included as a separate treatment stage, although patients can receive surgery at any time. Costs were taken from published sources, and utilities from Markov modeling. Transition probabilities of available contemporary data and reporting of modelling methods posed challenges for model development; in particular the lack of data on the efficacy of combination treatment and probabilities of sustained response on anti-TNF-α therapies. RESULTS: In a patient cohort (mean age 35), lifetime costs and QALYs (E1,400,000) were €169,560 and 14.85 (20.97) for a treatment pathway where patients initiated therapy with steroids + azathioprine followed by azathioprine maintenance, progressed through more intensive steroid induction, available anti-TNF-α and surgery, ultimately becoming treatment refractory. CONCLUSIONS: This model represents an advance in economic evaluation of CD, allowing lifetime evaluation of treatment strategies in a complex treatment area. Further research into the natural history of CD would improve the potential for robust economic evaluation.

PMR7 MAPPING THE MEANINGS OF WORDS PATIENTS USE TO DESCRIBE THEIR PAIN
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OBJECTIVES: To identify the meanings of descriptors patients use to describe the quality of pain. We hypothesized that patients identify as synonyms for the same pain sensation. METHODS: Subjects were recruited by web posting and telephone screening. Those self-reporting active treatment for Migraine or Low Back Pain (LBP) were scheduled for in-person interviews using card sort sort sorts with 93 different pain descriptors to identify those each subject commonly used to describe the pain associated with their condition, and to identify pairs of descriptors that describe the same pain. Network maps that diagrammed patient identified equivalences between descriptors were created for each condition using Netdraw (Borgatti 2002) and then compared.
RESULTS: Subjects ranged between 19 and 70 years (mean age of 41). The majority (73%) was female, 65% were working full or part-time, and 59% were Caucasian. Migraine patients identified more descriptive synonyms to describe their pain (10% of all words used synonymously formed a single large cluster of connections. For the LBP patients associated it with THROBBING/GNAWING/FLASHING. TIGHT as equivalent with SQUEEZING/CRUSHING, while LBP patients associated it with EQ-5D score (Spearman R-squared). RESULTS: Mapping results were similar across all techniques and predictor lists. The reverse two-part GEE model had the best predictive performance (AUC of 0.99, MAE 0.140) using all predictors, but correlated relatively weakly with the original EQ-5D results (Spearman R-squared 0.34). CONCLUSIONS: Mapping VTFQ-25 scores to EQ-5D utilities results in low predictive power independent of the modelling methodology applied. The difficulties in this mapping exercise are likely the result of the inability of the EQ-5D to discriminate vision-related activities.

PMR9 INTEGRATING PATIENT PREFERENCES AND CLINICAL TRIAL DATA IN A BAYESIAN MODEL FOR QUANTITATIVE RISK-BENEFIT ASSESSMENT
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OBJECTIVES: Regulatory agencies show a growing interest in quantitative models for risk-benefit assessments to increase decision transparency. Regulators increasingly encourage the use of patient’s view on benefit-risk tradeoffs but little is known on how to integrate elicited preferences into the quantitative models. There is little knowledge on how to integrate these preferences with clinical performance data and how to use knowledge about the uncertainty surrounding both types of parameters for risk-benefit assessments. This objective of this study was to demonstrate how patient preferences can be integrated in a Bayesian framework for quantitative risk-benefit assessment. METHODS: An MCDA model was developed that integrates clinical trial data, elicited patient preferences and uncertainty surrounding these estimates. Stochastic characteristics of preference and drug performance parameters can be approximated from stated preference studies and performance data from systematic reviews or RCT’s. Risk and benefit scores of drugs are then simulated with Monte Carlo methods using approximated distributions. The acceptability (pros where weighted benefits > weighted risks) is calculated. A ‘benefit-risk factor’ with acceptability graphs is provided, to facilitate decision makers in their appraisal. RESULTS: The model was applied to an anti-depressants case. We included two benefit and one risk criteria. Preference data was derived from an expert panel and the performance data (pooled odds ratio’s compared to placebo) were derived from a systematic review. The simulations show all drugs have high (~1) acceptabilities. The model is more sensitive to performance information than to preference information and most sensitive to the adverse events performance criterion. CONCLUSIONS: Using this MCDA model it is possible to include quantitative risk-benefit assessment. The model allows integration of stochastic uncertainty concerning preference and performance. It demonstrates that comprehensive presentation of data is possible. We are currently working on applying the model to a case on advanced renal cell carcinoma.

PMR8 PROPORTIONAL HAZARDS ASSUMPTION AND ITS IMPACT ON RESULTS OF COST-EFFECTIVENESS ANALYSIS
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OBJECTIVES: If proportional hazards assumption holds, Cox regression allows for estimation of treatment effect in the form of hazard ratio. The common practice is to fit parametric model to control arm, then to apply hazard ratio to predict treatment arm. However proportional hazards assumption is rarely verified. Our aim was to estimate how proportional hazards assumption may impact cost-effectiveness. METHODS: Markov model was developed to describe cancer patients treatment. Health states distinguished in the model were: progression-free, progression and death. Time to progression and death were obtained from clinical trials for breast and renal cell cancer and implemented into the model on the basis of Weibull curves, fitted to data from clinical studies. Calculations were carried out separately with or without using given hazard parameters. It was assumed that compared interventions differ only in terms of time to progression or death. All the other parameters were the same for both arms. RESULTS: In case of renal cell carcinoma the cost of intervention was compared with sunitinib alone. When time to progression differs between interventions the average time spent by patient in progression-free state was 1.39 vs 0.72 years and 2.01 vs 0.72 years with and without proportional hazards assumption, what lead to differences in QALY of 0.20 and 0.39 respectively. When time to death differs between interventions the average survival was 5.17 vs 6.65 years and 5.41 vs 6.65 years with and without proportional hazards assumption and that resulted in differences in QALY of 1.01 and 1.11. CONCLUSIONS: These results indicate that, taking costs into account, proportional hazard assumption may have large impact on cost-effectiveness. Proportional hazards assumption should be always checked and its impact on obtained results should be estimated in sensitivity analysis.