rituximab, following the failure of one previous TNF inhibitor. Upon treatment failure it was assumed patients would follow an identical lifetime treatment strategy consisting of: leflunomide, gold, cyclosporine and palliative care. As is currently recommended by NICE no second TNF inhibitor was assumed to be administered. Rituximab was assumed to be administered every 9 months for responding patients. ACR response rates were taken from the respective phase III RCTs and adjusted for placebo response. The initial HAQ drop by ACR category was taken from the REFLEX RCT, with long-term HAQ progression from published literature. RESULTS: Annual drug acquisition and administration costs were lower for rituximab compared to abatacept. Discounted total lifetime direct NHS costs were £46,570 and £63,055 for the rituximab and abatacept groups respectively. Rituximab generated a discounted cost-saving of £16,485 per patient due to reduced drug acquisition and administration costs. Total QAL Ys were estimated as 3.879 and 3.812 for rituximab and abatacept, respectively. CONCLUSION: The model predicted that rituximab dominated abatacept for RA patients who have failed one previous TNF inhibitor therapy with higher estimated QALYs and lower NHS costs. Due to lower drug administration requirements rituximab may also generate a capacity benefit to the NHS compared to abatacept, through lower annual infusion and outpatient requirements.

**PAR23**

**COST-UTILITY OF ABATACEPT, A NEW BIOLOGIC TREATMENT FOR PATIENTS WITH RHEUMATOID ARTHRITIS WHO FAILED ANTI-TNF THERAPY**

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OBJECTIVES: Rheumatoid arthritis (RA) is a chronic autoimmune disorder associated with substantial health and economic burden. We describe a cost-utility model developed to assess the cost-utility of Abatacept in the treatment of RA in the UK (NHS). METHODS: A probabilistic patient level simulation model was developed to estimate long-term costs and health outcomes of abatacept versus methotrexate (MTX) in RA patients who failed anti-TNF therapy. The model predicted patients’ HAQ (Health Assessment Questionnaire) scores over time based on the initial response to treatment (% change in HAQ at six months). Patients with an inadequate response (failure to achieve a specified reduction in HAQ score) ended treatment at this point. Responding patients continued treatment with a reduced rate of HAQ progression until long-term treatment failure—modelled as an exponential process. On long term treatment failure, patients’ HAQ was assumed to worsen by amount equal to their initial improvement. Efficacy and adverse events rates were obtained from a randomized clinical trial. Costs, utility and annual mortality rates (AMR) were estimated as a function of HAQ. RESULTS: Compared to MTX, Abatacept treatment results in 1.6 additional QALYs at an additional cost of £40,371, giving an ICER of £25,395/QALY, a value in line with other biologic treatments recommended for use in the UK. Results were stable under a range of sensitivity analyses. CONCLUSION: Compared to MTX, Abatacept is a cost-effective treatment for patients who failed anti-TNF therapy. The use of a patient level simulation allows costs and utilities to be estimated as non-linear functions of HAQ and for the AMR to be conditioned on patient’s HAQ scores. The model was implemented in R and was sufficiently fast for probabilistic analysis. This allowed two key requirements for decision-making to be met: unbiased estimates of costs and effects and an assessment of the decision uncertainty.

**PAR24**

**COST-UTILITY ANALYSIS OF RITUXIMAB TREATMENT IN RHEUMATOID ARTHRITIS AFTER ANTI-TNF-ALFA THERAPY IN HUNGARY**

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OBJECTIVES: The targeted B-cell therapy rituximab (RTX) is registered for patients with rheumatoid arthritis (RA) who have had inadequate response or intolerance to one or more TNF-alpha blocking agents. The only third payer in Hungary, the National Health Insurance Found required economic data about RTX treatment for reimbursement decision. The aim of our study was to estimate the cost-effectiveness of RTX in Hungarian context in RA patients who failed anti-TNF therapy. METHODS: We developed a Markov model to perform a cost-utility analysis. Cost per quality adjusted life year (QALY) gain was assessed. RTX was compared with traditional treatment (DMARDs) in the model. Model states were defined by ACR responses. Baseline characteristics of the patient population and clinical efficacy were based on international data, the REFLEX trial. Costs of rituximab (drug therapy, administration and monitoring) were calculated based on official Hungarian price list. RA related costs were taken from a previous Hungarian cost-of-illness study considering disease levels by HAQ. Utility was derived using the equation between HAQ and EQ-5D from a Hungarian survey of RA patients. The time horizon of the model was lifetime. Cost effectiveness analysis was performed for one year RTX treatment. The model used a societal perspective including all costs. RESULTS: One year long RTX treatment (9 month between courses) results in 0.228 QALY gain compared with traditional treatment in lifetime perspective. Incremental total costs were 6,224 Euros, cost-effectiveness ratio was 27,258 Euros/QALY. Cost-effectiveness of two years long RTX treatment is 23,182 Euros/QALY. Increasing the duration of treatment resulted better cost-effectiveness ratio. CONCLUSION: Cost-effectiveness of RTX is under the commonly used financing threshold (30,000€/QALY), although RTX was compared with low cost traditional treatment. Hungarian cost-effectiveness ratio may be higher than the European average because drug costs are comparable but medical costs are lower in Hungary than in the EU.

**PAR25**

**ASSOCIATION OF PERSISTENCE WITH ANTI-TUMOR NECROSIS FACTOR (ANTI-TNF) THERAPY AND HEALTH CARE COSTS IN PATIENTS WITH PSORIATIC ARTHRITIS**

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OBJECTIVES: Evaluate the impact of persistence with anti-TNF treatment on total health care and medical costs among patients with psoriatic arthritis (PsA). METHODS: A retrospective study was conducted using the US PharMetrics managed-care-plan database from January 2000 through June 2005. Patients continuously enrolled for 6 months pre- and 12 months post-index biologic date and having 2 distinct claims for PsA were included.
Persistence rate (%) was defined as the number of days between first biologic prescription and last biologic encounter, divided by 365 and multiplied by 100. Two mutually exclusive cohorts were defined based on their persistence rates: patients with persistence $\geqslant 80\%$ and patients with persistence $< 80\%$. Total health care and medical costs were assessed during the study period. Per patient per month (PPPM) costs were calculated. Cost of adverse events could not be identified separately in this analysis. A multivariate model was used to adjust for covariates including age, gender, Charlson Co-morbidity Index (CCI), and pre-index period health care costs. RESULTS: In all, 358 patients were included, 206 (57.5\%) with a persistence rate $< 80\%$ and 152 (42.5\%) with a persistence rate $\geqslant 80\%$. Nearly half were female and the mean age was 45.2 years. The higher persistence cohort had lower PPPM medical costs ($359.54$ versus $407.14$) and total health care costs ($1541.36$ versus $2653.30$) compared with the lower persistence cohort. Also, the multivariate analysis indicated that after adjusting for the confounding factors: age, gender, CCI, and pre-index period health care costs, a higher persistence rate is significantly associated with lower total health care PPPM costs ($P < 0.0001$).

**CONCLUSION:** A higher persistence rate with anti-TNF therapy is associated with lower health care costs. Future studies to examine the impact of persistence with anti-TNF therapy on clinical and humanistic outcomes in patients with PsA are recommended.

**ARTHRITIS—Health Care Use & Policy Studies**

**PAR26**

**THE UNINTENDED CONSEQUENCES OF WITHDRAWING DRUGS FROM THE MARKET**

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OBJECTIVES: On September 30, 2004, rofecoxib—a drug used to treat inflammation—was voluntarily withdrawn from the US market due to mounting evidence of increased cardiovascular (CV) risk. This study sought to assess movement in the number of clinically appropriate (CAP) cyclo-oxygenase (COX)-2 prescriptions dispensed after the rofecoxib withdrawal; and whether patients with CAP profiles demonstrated different post-withdrawal switching behavior or incurred different levels of health care costs. METHODS: Administrative claims data from four regional health plans were used. To examine differences in clinically appropriate prescribing pre- and post-rofecoxib withdrawal, a generalized estimating equations approach was used. RESULTS: Based on a total of 317,762 prescriptions, this study found that CAP prescribing rates were lower after news of the increased drug risk, as were the total number of COX-2 prescriptions that were clinically inappropriate. Patients with CAP risk were more likely to exhibit switching behavior by filling prescriptions for nonselective (ns) NSAIDs or discontinuing use of all NSAIDs. Health care costs incurred in the year following the rofecoxib withdrawal were lower for patients who were prescribed COX-2s appropriately. CONCLUSION: These findings suggest that the widespread coverage of the rofecoxib withdrawal, which led to heightened awareness of the drug’s risk affected consumer demand for COX-2s and may have had unintended consequences in reducing the number of patients who “should have been” receiving these medications according to clinical risk. Because patients and physicians were forced to make a medical decision under risk, increased information of the benefit-risk tradeoff may have been helpful and may have contributed to greater consumer welfare.

**PAR27**

**WITHDRAWAL OF ROFECOXIB FROM THE MARKET; THERAPEUTIC AND ECONOMIC IMPLICATION FOR THE NETHERLANDS**

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**OBJECTIVES:** Pharmacovigilance is a very important tool for registration authorities and pharmaceutical industries to gather extra information on effectiveness and adverse effects of widely used drugs. Therefore, post-marketing research can lead to new insights on therapeutic usability and consequently changes in registration files or even result in market withdrawal. In September 2004, rofecoxib was withdrawn from the market for reasons of serious cardiovascular adverse events. Our objective was to evaluate trends in market-share and expenditures of cyclooxygenase-2 (cox-2) selective and non-selective NSAIDs around market withdrawal of rofecoxib. METHODS: Analyses were conducted using pharmacy prescription data from IADB.nl (50 pharmacies), covering a Dutch population of 500,000 subjects. NSAID-use was calculated per 10,000 of the population and presented quarterly from 2000–2006. Expenditures related to NSAID-use were calculated and presented in costs per 1000 of the population. RESULTS: After market introduction of cox-2 selective NSAIDs, proportional use increased to a maximum of 17\% in the third quarter of 2004. After market withdrawal of rofecoxib, the number of subjects receiving celecoxib and etoricoxib increased enormously (from 22 to 48 and 18 to 28 subjects per 10,000 population, respectively), but decreased shortly thereafter. Similar results were found for new users. After market withdrawal, costs per 1000 population decreased with 65\% and 24\% for cox-2 selective and the total group of NSAIDs, respectively. During additional study follow-up, costs per DDD were generally increasing for cox-2 selective and decreasing for other NSAIDs. Further results will be presented on switching patterns from rofecoxib to other NSAIDs, with a specific focus on concomitant use of proton-pump-inhibitors for gastrointestinal protection and related extra costs. CONCLUSION: Withdrawal of rofecoxib from the Dutch market resulted in a decreasing number of subjects receiving cox-2 selective NSAIDs (class-effect) and lower expenditures for the whole group of NSAIDs. Further research is currently conducted to complete the full economic picture.

**PAR28**

**GEOGRAPHICAL VARIATION OF PHARMACOLOGICAL PRESCRIPTION WITH BAYESIAN HIERARCHICAL MODELS**

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**OBJECTIVES:** The pharmacological prescription can present geographical variation due to multiple factors. The aim of this communication is to introduce the spatial variability in the evaluation of different individual outcomes. METHODS: Pharmacological prescription data of 10,410 persons with diagnosis of osteoarthrosis were analyzed. The prescriptions were fulfilled during the year 2006 in the health department 11 of the Comunitat Valenciana (Spain). The number of recipes, the number of prescribed principles and the pharmaceutical expense for every patient were evaluated. The relationship with gender and age was explored by means of generalized linear models. The geographical variation between different administrative units is introduced by means of heterogeneity and structured random effects. The proposed hierarchical models were analyzed using Bayesian methods with MCMC procedures. RESULTS: Models with random spatial effects explain an important part of the variabili-