i.e. ARAMIS and CEFAC, for cost-effectiveness analysis in Russia is not possible due to differences in the disease classifications and lack of statistical data. The purpose of this work was the modeling of HIV progression in Russian HIV-infected populations.

**METHODS:** We develop the Markov model based on transitions through four mutually exclusive health states defined by CD4+ cell count ranges (>500, 350–500, 200–300, <200 cells/μl) and death and baseline characteristics of high prognostic significance, such as viral load, age, sex, and antiretroviral treatment receiving. To identify the model’s parameters we used state transitions and statistics of the Russian Federal Research Centre for Prevention and Control of AIDS. In order to validate the model we calculated life expectancy after diagnosis using Monte-Carlo simulation of treated and non-treated cohorts. To study the influence of treatment on life expectancy we used the 1st line regimen abacavir + lamivudine + efavirenz.

**RESULTS:** Life expectancy of treated patients is significantly higher compared to patients who did not receive treatment (medians and quartiles 24.6 [22.6; 26.5] and 13.8 years [12.7; 14.4] years, respectively, P<0.001, Mann-Whitney U-test). These results were validated by the results of the meta-analysis and the analysis of PLD output from CDM was undertaken using R version 2.15.2. UK costs (in GBP) and health benefits were discounted at 3.5%. **RESULTS:** Mean discounted QALYs were 7.01 years (SD 2.5). QALE decreased with increasing age (>19 year, p<0.001) and (<18 year, p<0.001) for metformin + SU and metformin + vildagliptin regimens, respectively. Increasing diabetes duration was associated with a greater decrease in QALE with metformin + SU (>18 year, p<0.001) compared to metformin + vildagliptin.

**CONCLUSIONS:** The statistical analysis of PLD output provides a mechanism for identifying greatest potential health gains. Despite being positive in all patients, gains in QALE were greater in patients with a longer diabetes duration and metformin + vildagliptin regimen compared with metformin + SU under a real-life setting.

**PM112**

**SURGERY AS AN OUTCOME IN COST-EFFECTIVENESS ANALYSIS**

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**OBJECTIVES:** Surgery in cost-effectiveness analysis can lead to counter-intuitive results, with patients whose disease progresses faster undergoing surgery sooner. As surgery typically results in improved quality of life (QoL) following intervention, the social impact on ICERs for less successful surgical intervention can be potentially overestimated. In a sample of NICE technology appraisals covering surgery, surgery had minimal influence on model results. With both low incidence and no substantial impact of surgery on QoL, from this review a number of factors have been found to influence the magnitude of this impact. These include health state utilities before and after surgery, and timing of surgery. Decision rules are required that ensure that surgery is appropriately accounted for when making decisions, factoring in higher surgical rate into decision making may partly address this issue.

**PM113**

**TIMED AUTOMATA MODELING OF THE PERSONALIZED TREATMENT DECISIONS IN METASTATIC CAstration RESISTANT PROSTATE CANcer**

Schino S, Degeling K, Koffijberg H, Ureeman M, Langsrak R

**OBJECTIVES:** The Timed Automata modeling paradigm has emerged from Computer Science as a mature tool for the functional analysis and performance evaluation of distributed systems. This study is a first exploration of the suitability of Timed Automata for health economic modeling, using a case study on personalized treatment for metastatic Castration Resistant Prostate Cancer (mCRPC).

**METHODS:** The treatment process has been modeled by creating several independent timed automata, where an automaton represents a patient, a physician, a test, or a treatment/testing guideline schedule. These automata interact via message passing and are fully parameterized with quantitative information. Messages can be passed, asynchronously, from one automaton to one or more other automata, at any point in time, thereby triggering events and decisions in the treatment process. In the automata time is continuous, and both QALYs and costs can be evaluated by a more event having a temporal impact on patient QoL. From this review a number of factors have been found to influence the magnitude of this impact. These include health state utilities before and after surgery, and timing of surgery. Decision rules are required that ensure that surgery is appropriately accounted for when making decisions, factoring in higher surgical rate into decision making may partly address this issue.

**PM111**

**THE ROLE OF PATIENT LEVEL DATA IN ASSESSING HEALTH ECONOMIC MODEL: A CASE STUDY USING EDGE AND THE CORE DIABETES MODEL**

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**OBJECTIVES:** The observational, non-interventional EDGE study showed that a DPP-4 inhibitor is efficacious in patients with type 2 diabetes mellitus who have suboptimal glycaemic control on metformin monotherapy in the real-life setting, confirming the results of previous randomised clinical trials. We sought to perform a health economic evaluation using patient level data (PLD) from EDGE and the Core Diabetes Model (CDM) to evaluate the lifetime costs and quality adjusted life expectancy (QALE) of two different regimens: metformin + vildagliptin compared to metformin + sutilimab. We used probabilities and timing intervals that can be uniformly or exponentially distributed. Software for building timed automata is freely available for academic use and on-line procedures can be found to check the model constraints and the (internal) behavior and results of the model.

**RESULTS:** In several days a Timed Automata model has been produced that is compositional, easy to understand and easy to update. The behavior and results of the model has been assessed using the mCPS tool. Actual results from the model obey the mCPS tool. The Timed Automata model is compared with results of a Discrete Event Simulation model in a separate study. **CONCLUSIONS:** The Timed Automata paradigm can be successfully applied to evaluate the potential benefits of a personalized treatment process of mCPS. The compositional nature of the resulting model provides a
good separation of all relevant components. This leads to models that are easy to formulate, validate, understand, maintain and update.

PM114

COST-EFFECTIVENESS ANALYSIS OF SCHIZOPHRENIA TREATMENT WITH HALOPERIDOL, OLANZAPINE AND RISPERIDONE: AN ONTOLOGICAL APPROACH

HERCEGOVINA, REPUBLIC OF SRPSKA BY APPLICATION OF THE MARKOV MODEL

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OBJECTIVES: Schizophrenia is a persistent and costly disease, which requires a continuous antipsychotic treatment. In antipsychotic treatment of schizophrenia, the differences in terms of effectiveness, tolerance, incidence of side effects, relapse and costs have implications regarding the cost-effectiveness. The objective of the specialist research is to investigate the cost-effectiveness of second generation antipsychotics (SGA) in treatment of patients with schizophrenia in the RS healthcare scene. METHODS: The Markov model was developed to assess the incremental cost-effectiveness of olanzapine and risperidone (SGA) in relation to haloperidol (FGA). The cohorts of patients were adult patients diagnosed with schizophrenia. Translational probabilities were taken over from a major meta-analysis conducted by FEI. Inclusion criteria were: English or Dutch language, model of economical evaluation, chemotherapy or targeted therapy as intervention, population diagnosed with schizophrenia, the studies included in 2000 to 2014, 2014, reporting life-years (LY) or quality-adjusted life-years (QALY), and reporting an incremental cost-effectiveness ratio (ICER). Quality of the studies was assessed through a checklist. Standardised extraction sheet was used to retrieve general characteristics, modelling characteristics and results of the studies. RESULTS: Twenty-six studies were included and provided two cost-effectiveness estimates. Eighteen studies used a health-state-transition model including the following health states: stable/progression-free disease, progression and death. Subgroup analyses were conducted in three studies. Studies were of poor quality. Administration frequency of the regimens, type of model, perspective of the analysis, costs and model were not specified in all studies. CONCLUSIONS: The results of the studies were highly variable and the quality of the studies was poor. Comparison of studies was hampered because of under-reporting and the limited number of studies comparing the same regimens. Consequently, no firm conclusions could be drawn concerning the effect of modelling characteristics on outcomes.

PM115

DECISION-ANALYTIC MODELING STUDIES: AN OVERVIEW FOR CLINICIANS USING DLBCL AS AN EXAMPLE

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OBJECTIVES: Diffuse large B-cell lymphoma (DLBCL) is the most common form of NHL, accounting for up to 30 percent of newly diagnosed cases in the United States and Europe. The purpose of this study was to provide a clinician-friendly landscape of decision-analytic models evaluating different treatment strategies for DLBCL. METHODS: A comprehensive search strategy was developed and a systematic literature search in Pubmed and EMBASE from 1996 to June 1, 2015 was conducted to identify studies evaluating DLBCL treatment strategies. The search strategy encompassed decision-analytic models. Studies were screened using predefined inclusion criteria after which data from included trials were extracted, by two independent reviewers and disagreements resolved by a third reviewer. We included studies that were published in English, were full studies and reported clinical end points and summarized methodological characteristics (e.g., modeling approaches, simulation techniques, health outcomes, perspectives). RESULTS: Seven decision-analytic modeling studies met our inclusion criteria out of the total 285 citations. Major modeling approaches adopted were: decision-tree modeling, Markov state-transition modeling, event based microsimulation/patient level simulation. Health outcomes included: overall survival, number needed to treat, life expectancy, and quality-adjusted life years, time horizon and cycle length. All the studies were critically appraised using quality of health economic scale (QHES) and were found to be moderate to high quality. Evaluated therapeutic strategies comprised chemotherapeutic combination- based therapeutic regimens and stem cell treatment. An overview of modeling characteristics on the iQALY estimates. Administration frequency of the regimens, type of model, perspective of the analysis, costs and model were not specified in all studies. CONCLUSIONS: The review provides a comprehensive overview of modeling studies assessing treatment of DLBCL which could be used by researchers to develop novel models in DLBCL.

PM118

2RX MCDM: A FULLY FLEXIBLE TOOL TO SUPPORT THE LOCAL ADAPTATION OF MULTIPLE-CRITERIA DECISION CRITERIA IN HEALTH CARE

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OBJECTIVES: Multiple-criteria decision analysis (MCDA) is a sub-discipline of operations research that explicitly considers multiple criteria in decision-making environments. Formally structuring complex problems appropriately and considering criteria explicitly leads to more informed and transparent decisions. MCDA methods are increasing in popularity, however existing instruments and approaches are rigid and do not reflect local decision making needs and preferences. 2RX MCDM was developed as a highly flexible tool to support the application of local multiple-criteria decision analysis in health care. This tool was used to evaluate, as an example, three alternatives for the management of anemia associated with chronic kidney disease: Procrit, Aranesp and a Biosimilar (EpoGen Zeta). METHODS: There are multiple MCDA standard methods that can be applied and the 2RX MCDM tool has been validated against the publications of such methods. Users enter desirable data by selecting an appropriate number of alternatives and criteria relevant to particular decision-making context. Further, criteria scale and weights are defined to obtain results (alternatives in sequence of importance) per different MCDA calculation methods. Seven local decision-makers applied inter-criteria weights using visual analog scale (VAS). RESULTS: Results of the Simple Linear Additive Model (SLAM) method, the decision-making criteria as ranked in order of importance were safety, budget impact, cost-effectiveness and unmet medical need (equal third), patient preferences and strategic considerations. Global scores calculated for Aranesp were marginally higher than for the biosimilar (0.52 vs 0.51), which was scored lower. When Multi Attribute Value Theory (MAVT) method was further applied, total score differentiation was more pronounced: Aranesp, Biosimilar and Procrit (0.57, 0.50 and 0.47). CONCLUSIONS: 2RX MCDM tool has been successfully applied in a local decision making context. By not relying on, or promoting, pre-defined criteria, level definitions and weighting/aggregation methods, the tool is fully flexible and adaptable to high precision local decision making needs and preferences.