OBJECTIVES: CDC guidelines recommend hepatitis C virus (HCV) screening for all adults. Since HCV prevalence is decreasing with age-specific screening is less cost-effective in later cohorts. To inform the optimal time to discontinue screening, collecting additional information may be valuable, though when this information should be collected is unclear. METHODS: We applied a Markov decision process framework to evaluate how long to continue HCV screening in US men. We identify the optimal information collection policy for two parameters assumed constant across cohorts - reductions in quality-of-life from awareness of HCV-positive status and the fifty-fold-stage distribution at screen-detected diagnosis at age 50 - alone and in combination with information collection about HCV prevalence which is decreasing across cohorts. We estimate lifetime costs and benefits using a previously-developed HCV screening model and HCV prevalence dynamics derived from NHANES. The assumption underlying the pay threshold is $75,000 per QALY. RESULTS: The presence of a parameter which varies across cohorts influences the per-person value-of-information about both time-varying and static parameters. In some settings, optimal strategy may be to delay information collection. Given our prior beliefs, the optimal strategy is to collect sample information about the reduction in quality-of-life from awareness of HCV-positive status immediately and then, depending on the result of that study, collect information on HCV prevalence 3 to 10 years in the future. This strategy increases the expected incremental net monetary benefit by $2.3 million compared to a strategy of collecting information about both immediately. CONCLUSIONS: We demonstrate that when parameters vary across cohorts, the optimal information collection policy, for both time-varying and static parameters, may be to delay information collection until it is more likely to influence the decision. Our dynamic programming framework enables the consideration of delayed information collection in numerous contexts.

PMF53
FRONTIERS IN PEDIATRIC HEALTH TECHNOLOGY ASSESSMENT: DEVELOPMENT OF A DISCRETE EVENT SIMULATION MODEL FOR ECONOMIC EVALUATION OF SCREENING, DIAGNOSIS AND TREATMENT STRATEGIES IN AUTISM SPECTRUM DISORDER
Zur EM, Carter MT, Scherer SW, Unger WJ
Hospitai for Sick Children, Toronto, ON, Canada

OBJECTIVES: There are few economic evaluations of strategies for screening, diagnosis, and treatment of autism spectrum disorder (ASD). The objective of this study was to create a discrete event simulation (DES) model of the pathway of care for children with suspected ASD up to age 6. This model will be used to perform economic evaluations of screening protocols, diagnostic tests, and treatments for ASD. METHODS: A DES model was conceived to simulate a Canadian population of children with suspected ASD. Attributes important for simulation of entities were identified from the literature and expert opinion. Important categories of attributes included ASD risk factors, ASD co-morbidities, measures of development, and measures of severity of ASD. The pathway of care was created with review of current practice guidelines as well as consultation with developmental pediatricians. Queuing for screening, diagnosis, and treatment comes from entities accessing limited resources over a period of time. We will use calibration techniques to set resource and time limits to match the wait times reported in the literature. RESULTS: A DES model was built for children with suspected ASD up to age 6. The DES model addresses population heterogeneity by including risk factors such as gender, autistic siblings, and older parents, genetic co-morbidities, and physical and psychological co-morbidities. The DES model includes four different outcomes in terms of severity, IQ, and language skills. The DES model addresses the issues of wait times that are relevant in ASD screening, diagnosis, and treatment by having entities wait for limited resources. The DES modelling approach is well suited for evaluating the pathway of care for ASD patients. Patients with ASD have a wide variety of disabilities and co-morbidities that can be captured in des modelling. DES modelling is able to address issues of wait times that are prevalent in ASD screening, diagnosis, and treatment.

PMF54
PREDICTING HEART FAILURE RECURRENT AFTER AORTIC VALVE REPLACEMENT USING A COMPETING-RISKS MODEL
Chan V1, Anderson LH2, Martinson M3, Koukik M4, Ruel M5
1University of Ottawa Heart Institute, Ottawa, ON, 2Technomics Research, Ottawa, ON, 3Ottawa, ON, Canada

OBJECTIVES: Congestive heart failure (CHF) is a major health burden with an increasing prevalence and incidence. Risk factors associated with recurrent CHF following surgical AVR have been previously described in a multivariate model by Ruel et al. The objective of this study was to re-create the previously described model without relying on the initial patient-level data. METHODS: The semiparametric Cox proportional hazards model described by Ruel et al. was based upon 1563 patients who underwent AVR at the University of Ottawa Heart Institute between 1976 and 2001. Adjusted hazard ratios and mean covariate values were reported. Several distributions, including exponential, Weibull, and competing-risk models, were tested to determine which would better reproduce the recurrent CHF function. RESULTS: All candidate models successfully reproduced the published results by Ruel et al. One model was converted into a customizable excel model. Clinically-relevant variables included in the re-created model included valve size, mean transprosthetic gradients, patient age, atrial fibrillation, preoperative NYHA class, body surface area, coronary artery disease, and smoking. After adjustment of patient and valve characteristics, the model predicted freedom from recurrent CHF at 1, 3, and 5 years to be 90.2%, 82.1%, and 75.9%, respectively. RESULTS: The re-created model accurately predicted CHF recurrence. Statistical models validated using large patient cohorts can be useful in population management.

PMF55
HEMATOPOIETIC STEM CELL TRANSPLANTATION OUTCOMES: LOGISTIC REGRESSION MODEL DEVELOPMENT
Hatfield MD1, Kramer MA2, Johnson ML3
1University of Houston, Houston, TX, USA, 2The University of Texas MD Anderson Cancer Center, Houston, TX, USA

OBJECTIVES: The objective was to determine the most effective logistic regression models in terms of explaining the greatest amount of variance regarding four outcomes: graft versus host disease (GVHD), liver toxicity, neurotoxicity, and mortality, among a cohort of patients undergoing hematopoietic stem cell transplantation. METHODS: Busulfan is used in combination with fludarabine or cyclophosphamide as part of an effective chemotherapy based myeloablative preparative regimen for patients undergoing stem cell transplantation. Pharmacokinetic data regarding patient busulfan clearance was used in the analysis, since dosing is very sensitive. Other clinically relevant covariates included: age, gender, race, primary cancer, type of transplant (autologous or allogeneic), and prior transplant history. Descriptive statistics and logistic regression analyses were performed to assess the effect of these variables on each of four outcomes: GVHD, liver toxicity, neurotoxicity, and mortality. Hosmer and Lemeshow goodness-of-fit tests and varying-effects logistic models were used to optimize the models. Only aggregate level information was reported. Statistical significance was set at 0.05. RESULTS: Data on a cohort of 752 patients undergoing hematopoietic stem cell transplantation were collected. Most patients were: 46.7±15.8 years old, male (50.8%), Caucasian (68.6%), with acute myeloid leukemia (28.9%), underwent an allogeneic transplant (67.0%), and had not received a prior transplant (93.5%). Controlling for the covariates listed, the models resulted in Hosmer and Lemeshow goodness-of-fit test statistics (chi-square, number of events for freedom, per each dependent variable) as follows: (GVHD 2.57, 5, 0.77), liver toxicity (5.17, 8, 0.74), neurotoxicity (8.45, 8, 0.39), and mortality (5.95, 8, 0.65). The c-statistics for each model were: GVHD (0.87), liver toxicity (0.74), neurotoxicity (0.75), and mortality (0.72). CONCLUSIONS: The logistic regression models used were effective in determining the outcomes of GVHD, liver toxicity, neurotoxicity, and mortality, among a cohort of patients undergoing hematopoietic stem cell transplantation.

PMF60
THE ESTIMATE OF VACCINATION COVERAGE RATE USING TRANSMISSION DYNAMIC MODEL: A EXAMPLE OF PNEUMOCOCCUS VACCINES
Chang C1, Wen YW1, Fann CS2
1Chang Gung University, Tao-Yuan, Taiwan, 2Chang Gung University, Taiyuan, Taiwain, Academia Sinica, Taipei, Taiwan

OBJECTIVES: Vaccination coverage rate is usually obtained from the decision of an immunization policy. Actual impacts to the outcomes by different vaccinated recipients selection and their coverage rates were seldom discussed. This study aims to use a transmission dynamic model (TDM) based on a system of differential equations in susceptible-infectious-recovered-model to optimally explore the estimates of coverage rates. METHODS: 23-valent pneumococcal polysaccharide vaccines (PPV23) and 13-valent pneumococcal conjugate vaccines (PCV13) have been shown their cost-effectiveness in elderly and children, respectively. Scenarios of PPV23 to the elderly aged 65+ years and PCV13 to children aged below 4 years were assumed and TDM was used. All epidemiological parameters were obtained from the Taiwan National Health and the variables remained the same from the literature. Various vaccination coverage rates were considered. The equations were solved using the fourth-order Runge-Kutta method implemented in R Statistical software. RESULTS: Rates of PPV23 and PCV13 for the children were both 70% to achieve optimal goal. Increasing the rate over 70% will not significantly decrease the total number of pneumonia infection and death. However, the rate is less than 70%. CONCLUSIONS: This study proposes an approach to estimate the optimal vaccination coverage rate based on TDM models. This will provide value-based information of vaccination policy in the decision of vaccine quantity and recipients.

PMF61
PHYSICIANS' ATTRIBUTES AND REVERSED CONJUNCT ANALYSIS
Huang P, Edlund P, Schnittger I
ENDEPU Research, Inc, Cambridge, MA, USA

OBJECTIVES: The objective of this paper is the analysis of practice or physician's attributes in addition to patient or products 'attributes to explain patterns of drug utilization in predictive disease models including reversed conjoint data. In previous European physicians' cost sensitivity studies, physicians' characteristics such as demographics, solo/group practices, types of remuneration, location (depressed/wealthy areas) were not conclusive (ENDPU/Biomed, 2003). This analysis explores additional physicians'attributes more related to professional activities (Rutschack Zweifel,2012) such as referrals or restrictions to specialists, quality obligations and incident reporting. METHODS: Different types of physicians' choice sets are designed with sets of attributes classified in subgroups in 21,22,23 (21 for products, 22 for patients, 23 for physicians' attributes) . A sample of 688 patients diagnosed with diabetes type II without complications (ICD 250.00) is extracted from the National Medical Care Survey (Huttin/Wong,2010). Practices are grouped by stages of IT computerization for billing and EMRs. Pharmacological treatment (including oral, injectables and supplies) is defined with a drug list from Facts and Comparisons database in the year 2005. Physicians'treatment choices are analyzed with a disease model integrating Z3 products, Z2 for patients, Z3 for physicians' attributes) . A sample of 688 patients diagnosed with diabetes type II without complications (ICD 250.00) is extracted from the National Medical Care Survey (Huttin/Wong,2010). Practices are grouped by stages of IT computerization for billing and EMRs. Pharmacological treatment (including oral, injectables and supplies) is defined with a drug list from Facts and Comparisons database in the year 2005. Physicians'treatment choices are analyzed with a disease model integrating Z3 products, Z2 for patients, Z3 for physicians' attributes) . Physicians' treatment choices are assessed using the R statistical software 2.13.1, to run with SAS. RESULTS: Results of the predictive disease model on diabetes type II is shown in Table 1. Results indicate that physicians' treatment choices are significantly associated with demographic characteristics such as age, gender, race, number of years in practice, among others. CONCLUSIONS: This study presents an approach to estimate physicians' treatment choices in addition to patient or products' attributes to explain patterns of drug utilization in predictive disease models including reversed conjoint data.
The inclusion of physicians’ attributes is critical for discrete choice experiments. This study identifies some statistically significant attributes such as gender, race, income level, and education status. It also reveals the price sensitivity of physicians to different treatment options.

PMR62 INTEGRATING A PHARMADECMETIC MODEL-BASED META-ANALYSIS INTO A HEALTH ECONOMIC MICROSIMULATION MODEL OF COPD

Sleiko J1, Ribbing J2, Wilkie R2
1University of Washington, Seattle, WA, USA, 2University of Bergen, Bergen, Norway

OBJECTIVES: The purpose of this project was to build a simulation model describing the real-world economic and clinical outcomes associated with COPD treatment. The model integrates a pharmacometric model (PMBMA) with a microsimulation model (HEMM). The objective was to evaluate the impact of different treatment strategies on healthcare costs and quality-adjusted life years (QALYs).

RESULTS: The model was able to simulate the disease progression, treatment effects, and healthcare resource utilization for COPD patients. The results showed that the integrated model can provide valuable insights into the cost-effectiveness of different treatment strategies. The model was validated using real-world data from clinical trials and registries. The results were consistent with previous studies, providing additional evidence for the effectiveness of the model.

PMR63 A GUIDE ON HOW TO SPEEDUP COMPUTATION TIME IN CE-MODELS USING VBA OR MULTI-PROCESS PROGRAMMING IN C++

Kluge J, Hurewicz FA

F. Hoffmann-La Roche Ltd., Basel, Switzerland

OBJECTIVES: There is a trend of health economic models (HEM) becoming computationally intensive. This is particularly true for models that require the use of large datasets or complex algorithms. This can significantly slow down the simulation process. The goal of this project was to explore ways to speed up the computation time in health economic models.

RESULTS: The use of VBA or multi-process programming in C++ can significantly reduce the computation time. This is particularly true for models that require the use of large datasets or complex algorithms. The use of VBA can be used to speed up the computation time by up to 10X, while multi-process programming in C++ can speed up the computation time by up to 30X.

PMR64 A MODEL SIMULATING EXTERNAL REFERENCE PRICING TO SUPPORT POLICY DECISION MAKING IN EUROPE

Vallbracht A, Echelmeier C, Alhalea S, Durmi M
1University of Lyon 1, Villeurbanne, France, 2Cite-VD, Paris, France, 3Cite-VD, Paris, France, 4University Claude Bernard Lyon 1, Lyon, France

OBJECTS: The aim of this project was to develop a model that simulates the external reference pricing (ERP) process, applied to the 28 European Union Member States. The model includes various aspects of the ERP process, such as the calculation of ERP prices, the impact of ERP on market competition, and the impact of ERP on patient access to healthcare.

RESULTS: The model was able to simulate the ERP process and its impact on the healthcare market. The results showed that the ERP process can significantly reduce the price of drugs and improve patient access to healthcare. The model was validated using real-world data from European countries. The results were consistent with previous studies, providing additional evidence for the effectiveness of the model.

PMR65 REVIEW OF MODELS USED IN ECONOMIC ANALYSES OF NEW ORAL TREATMENTS FOR TYPE 2 DIABETES MELLITUS

Asche C1, Eirich DT2, Hippler S3
1University of Illinois, Peoria, IL, USA, 2University of Alberta, Edmonton, AB, Canada

OBJECTIVES: The purpose of this project was to review the use of economic models in the evaluation of new oral treatments for type 2 diabetes mellitus. The models were reviewed to assess their methodological soundness, including the assumptions, inputs, and outputs.

RESULTS: The review identified 20 economic models used in the evaluation of new oral treatments for type 2 diabetes mellitus. The models were found to be methodologically sound, with a high level of transparency and reproducibility. The models were found to be robust, with a high level of sensitivity analysis and scenario analysis.

PMR66 ESTIMATING THE TIME TRADE-OFF VALUES OF THE EQ-5D-5L HEALTH STATES IN URBAN CHINA

Liu N1, Liu G1, Li M1
1National University of Singapore, Singapore, Singapore, 2Peking University, Beijing, China, 3University of Maryland School of Pharmacy, Baltimore, MD, USA

OBJECTIVES: The EQ-5D-5L is a health state classification system consisting of five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), with each dimension described into five levels (no, slight, moderate, severe, and extreme). The purpose of this project was to estimate the time trade-off (TTO) values of the EQ-5D-5L health states in urban China.

RESULTS: The time trade-off (TTO) values were estimated using the TTO method. The TTO values were found to be consistent with previous studies, providing additional evidence for the validity of the model.

PMR67 IDENTIFYING AND CHARACTERIZING TRAJECTORIES OF QOL IN PERSONS WITH ADVANCED CANCER: IMPORTANT CONTRIBUTORS TO DECREASING QOL IN PEOPLE WITH CANCER

McGill University, Montreal, QC, Canada

OBJECTIVES: The aim of this project was to explore the temporal sequence leading to optimal QOL over time of key