OBJECTIVES: CDC guidelines recommend hepatitis C virus (HCV) screening for the increased awareness of HCV-positive status and the fifteen-fold change in HCV prevalence at 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 fifteen-fold change in 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 made was that 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- and age-related measures of HCV prevalence. However, it may be optimal 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 results of that study, collect information on HCV prevalence 3 to 20 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.

PRM57
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 RM, Carter MT, Schoener SW, Unge WJ
Hospital for Sick Children, Toronto, ON, Canada

OBJECTIVES: There are few economic evaluations of strategies for screening, diagnosing, and treating 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 incorporated 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 queue for limited resources. The DES modelling approach is well-suited to model the issues of wait times that are relevant in the ASD pathway of care for ASD patients. Population with ASD have a wide variety of disabilities and co-morbidities that can be captured in DES modelling. DES modelling is also able to address issues of wait times that are prevalent in ASD screening, diagnosis, and treatment.

PRM58
PREDICTING HEART FAILURE RECURRENT AFTER AORTIC VALVE REPLACEMENT USING A COMPETING-RISKS MODEL
Chan V1, Anderson LH2, Martinson M1, Kouliki M1, Ruel M2
1University of Ottawa Heart Institute, Ottawa, ON; 2Technomics Research, Ottawa, 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 has 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 models 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-risks models were tested in a semiparametric, 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 transprosthesis 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 5, 10, 15, and 20 years were 83.5%, 75.5%, 67.4%, and 59.4%, respectively. CONCLUSIONS: The re-created model accurately predicted CHF recurrence. Statistical models validated using large patient cohorts can be useful in population management.

PRM59
AUTOPOIETIC STEM CELL TRANSPLANTATION OUTCOMES: LOGISTIC REGRESSION MODEL DEVELOPMENT
Harfield MD1, Kramer MA2, Johnson ML1
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 outcome categories: 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 clofarabine as part of an effective chemotherapy based myeloablative preparative regimen for patients undergoing HSCT. The cumulative logistic model was used to identify patient busulfan clearance was used in the analysis, since dosing was 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 receiver operating characteristic curves 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 (59%), Caucasian (68%), with acute myeloid leukemia (29.8%), 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 degrees of freedom, p-value) for each dependent variable as follow: (GVHD: 25.7, 5, 0.77); liver toxicity (5.17, 8, 0.74); neurotoxicity (4.85, 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 were used in effective determining the outcomes of GVHD, liver toxicity, neurotoxicity, and mortality, among a cohort of patients undergoing hematopoietic stem cell transplantation.

PRM60
THE ESTIMATION OF VACCINATION COVERAGE RATE USING TRANSMISSION DYNAMIC MODEL: A EXAMPLE OF PNEUMOCOCCUS VACCINES
Chang CI1, Wen YW2, Fann CS3
1Chang Gung University, Tao-Yuan, Taiwan, 2Chang Gung University, Taoyuan, Taiwan, 3Academia 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) were used to assess 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 Taiwanese SD database and the vaccinated and the non-vaccinated from the literatures. Various vaccination coverage rates were considered. The equations were solved using the fourth-order Runge–Kutta method implemented in R Stochastic Simulation package of R. RESULTS: The relative estimates of PPV23 utility when ebilling was used (0.69). Additional runs are tested with predictive zones: 1, Wen Y.W. 1, Kramer M.A. 1, Rischatsch Zweifel, 2012) such as referrals or restrictions to specialists, quality obligations and incident reporting. METHODS: Different types of physicians’ choice settings are designed with sets of attributes classified in subclasses 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 250.0) is extracted from the National Medical Care Survey (Buntin,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 and a cost database in a 2005 database. Physicians’ treatment choices are analyzed with a disease model integrating 23 physicians’ attributes on subsets of physicians. The cumulative logistic model is run with SAS. RESULTS: Results of the predictive disease model on diabetes type II shows that drug usage among primary care physicians in clinical practice use a referral process (0.46). The stage of computerization of practices especially with ebilling remains highly significant (lower drug utilization when ebilling is used (0.69)). Additional runs are tested with predictive models on other chronic conditions (Asthma and Hypertension). CONCLUSIONS: