OBJECTIVES: CDC guidelines recommend hepatitis C virus (HCV) screening for the 1945-1965 birth cohort. Since HCV prevalence is decreasing with birth-year, 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-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 of an individual willingness-to-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 our model, information collection 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 and delay. 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
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OBJECTIVES: There are few economic evaluations of strategies for screening, diagnosis and treatment in 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 outcomes in terms of severity, IQ, and language skills. The DES model addresses the issue of wait times that are relevant in ASD screening, diagnosis, and treatment by having entities access limited resources over a period of time. The DES modelling approach is effective in simulating 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 also able to address issues of wait times that are prevalent in ASD screening, diagnosis, and treatment.

PRM58
PREDICTING HEART FAILURE RECURRENCE AFTER AORTIC VALVE REPLACEMENT USING A COMPETING-RISKS MODEL
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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 1963 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 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 transprosthesis gradients, patient age, atrial fibrillation, prophylactic 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 as 74%, 65%, 58% and 55%, respectively. The model predicted CHF recurrence with sensitivity of 83% and specificity of 77%, with positive likelihood ratios of 6.2 and negative likelihood ratios of 0.37. The model predicted recurrent CHF with AUC of 0.74.

CONCLUSIONS: The re-created model accurately predicted CHF recurrence. Statistical models validated using large patient cohorts can be useful in population management.

PRM59
HEMATOPOIETIC STEM CELL TRANSPLANTATION OUTCOMES: LOGISTIC REGRESSION MODEL DEVELOPMENT
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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 failure, 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 HSCTs in our institution. Pharmacometric 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 the four outcomes: GVHD, liver toxicity, neurotoxicity, and mortality. Hosmer and Lemeshow goodness-of-fit tests and AKI thresholds 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 (59.8%), 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 freedoms, p-value) for each dependent variable as follows: GVHD (2.57, 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 used were effective in 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 PNEUMOCOCCAL VACCINES
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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-infected-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's National Health Insurance Database and the vaccine efficacy was obtained from Rischatsch Zweifel,2012 such as referrals or restrictions to specialists, quality obligations, and incident reporting.

RESULTS: The c-statistics for each model were: GVHD (0.87), liver toxicity (0.74), neurotoxicity (0.75), and mortality (0.72).

CONCLUSIONS: This study proposes an approach to estimate the optimal vaccination coverage rate based on TDM outcomes. This will provide value-based information of vaccination policy in the vaccine quantity and recipients.