unvaccinated with the seasonal influenza vaccine and persons vaccinated during seasons when vaccine was considered by the CDC-reported vaccine effectiveness percentage (VE%)—(1-relative risk)*100% to a suboptimal match for seasonal flu strain. RESULTS: Published vaccine effectiveness for a suboptimal seasonal influenza vaccination ranged from 39%-63% from flu seasons 2006-2007 through 2011-2012. This was approximately the same protection observed in the largest claims database for the same year ranges. When modeled together with cost it was shown that this mismatch of vaccination to circulating virus still equated to a substantial reduction in burden of disease when vaccinated. Validation of results still ongoing. CONCLUSIONS: The burden of disease of influenza significantly decreases even when the seasonal influenza vaccine is a suboptimal match to the prevalent circulating strain. It is recommended that all persons receive the influenza vaccination each year do so, whether or not the match is optimal. It has been demonstrated that a suboptimal match effectively decreases the burden of the disease.

PRM63 FEASIBILITY AND ACCEPTABILITY OF MINIMAL MODELING VALUE OF INFORMATION ANALYSES FOR REAL-TIME PRIORITY DECISIONS WITHIN A LARGE CANCER CLINICAL TRIALS COOPERATIVE GROUP Bennette C.S., Radius A.L., Ramsey S., Carlson J.

1University of Washington, Seattle, WA, USA. 2Fred Hutchinson Cancer Research Center, Seattle, WA, USA

OBJECTIVES: Value of Information (VOI) analyses can help align research investments with areas that could have the greatest impact on patient outcomes, but many questions remain concerning its feasibility and acceptability to inform real-world prioritization decisions. Our objective was to develop a process for calculating VOI in “real-time” for high-throughput trials being conducted in the Setting. METHODS: We developed a minimal modeling approach to calculate VOI in real-time for high-throughput trials. Our objectives were to: 1) determine the practicality of this approach. 2) Assess the utility of this tool. 3) Evaluate the acceptance of this tool by stakeholders. RESULTS: Our minimal modeling approach is feasible and can be used to inform real-time decision-making. The results of these analyses will be presented at the meeting. CONCLUSIONS: Our minimal modeling approach is feasible and acceptable to stakeholders. Prospective use and assessment of this approach is currently underway.

PRM64 ALTERNATIVE METHODS FOR GENERATING ARBITRARY MARGINAL DISTRIBUTIONS AND THE IMPLICATIONS FOR SIMULATION OUTCOMES Zhou X. market solutions, PA, USA

OBJECTIVES: Generating multivariate random variables is essential in disease simulation applications. In this study we examine the implications of alternative approaches for generating marginal distributions in simulation models and correlation of outcomes. METHODS: We adopt three alternative methods including Cholesky Decomposition (CD), CD with conditional matching, and the NORMal-To-Anything (NORTA) method to generate a hypothetical simulation sample with arbitrary marginal distributions and the correlation matrix. As the comparator, we also create an independent and identically distributed (iid) simulation sample. The samples are individually populated in a previously developed type 2 diabetes microsimulation model to predict the major clinical endpoints over 15 years. The endpoints include all-cause mortality, diabetes-related mortality, and major cardiovascular events. We examine the goodness of fit by total deviance, i.e., the aggregated values of the relative difference between the individual predictions with the endpoints observed in the actual data, in the overall and stratified samples. RESULTS: The results show that, the model predictions deviate from the observed data with an iid sample. Over 15 years, the model over-predicts all the numbers of endpoint events by 20%, with the total deviance of 0.73, and the over-prediction is particularly pronounced in the younger patients. With a sample of a constructed multivariate normal distribution using the CD and CD plus conditional matching approach, the deviance is reduced to 0.41 and 0.58 respectively. A further improvement is observed when using the NORTA method, with the deviance of the endpoints between model prediction and actual data further reduced to 0.11. The reduction was mainly contributed by better approximations in the dispersion of the risk factors among patients. CONCLUSIONS: Randomization procedures that incorporate correlation of outcomes. Poorly-defined multivariate distributions may significantly distort the simulation performance. Given its flexibility for both continuous and discrete variables, NORTA method appears to be a preferable approach.

PRM65 AN EVALUATION OF COMPETING MODELS FOR PREDICTING CV EVENT RATES FROM LDL-C LEVELS IN SECONDARY PREVENTION Cone C.

Health Strategy, LLC, Remond, WA, USA

OBJECTIVES: This study aimed to evaluate four alternative models that describe the relationship between LDL-C and CV event rates in secondary prevention. A secondary goal of this analysis is to promote an approach to develop more reliable disease simulation models. METHODS: We applied previously described LDL-C and niacin+CV death outcomes were abstracted from several landmark secondary prevention trials in clinically stable patient populations (4S, CARE, LIPID, HPS, TNT, IDEAL, GEARCE, AVERT, and LIPS). Linear (L), quadratic (Q), one-knot linear spline (S1), and two-knot quadratic spline (S2) models were fit. RMSE, leave-one-out cross validated (LOOCV) and Monte Carlo cross validated (MCCV) RMSE (90 training, 1,000 replicates) were used to evaluate predictive performance. Predicted event rates for 5 years for LDL-C=150mg/dl were used to illustrate the characteristics of each model. To encourage full reproducibility and transparency, all raw data and code (R) will be made freely available for download online via authors Git repository. RESULTS: A total of eight models were fit and evaluated, including four distinct functional forms (L, Q, S1, and S2) across two sets of data (all data) and data censored for high leverage studies (C). Of all the models evaluated, S2-Q-C exhibited the lowest RMSE (0.317) while L-C produced both the lowest LOOCCVRMSE (0.463) and MCCVRMSE (0.589). Cross-validation had an impact on predicted performances/pr at 50mg/dL (range -0.76 to 2.09). CONCLUSIONS: This analysis suggests that a linear model may be among the most appropriate when describing the relationship between LDL and niacin+CV Death in secondary prevention, however, other models (linear spline quadratic) may be more appropriate in other disease states. Further research will help inform more reliable and accurate models of long-term outcomes and economic benefit of LDL-C lowering treatment modalities.


Emory University, Atlanta, GA, USA

OBJECTIVES: Malaria is a substantial global disease burden with 198 million cases reported worldwide in 2013. It disproportionately affects sub-Saharan Africa, particularly young children and accounts for 14% of the region’s childhood deaths. In an ongoing effort to improve disease control, the World Health Organization (WHO) launched in 2010 recommended countries test children (age < 5) who present with suspected malaria fever and confirm diagnosis rather than treat them presumptively with antimalarial drugs, the standard of care to date. While all 47 African countries designated as malaria-endemic have adopted the policy, implementation exist. These include costs, uncertainty about the overall health benefits, shortfalls in testing supplies and physician practice patterns. METHODS: We use a decision-analytic approach to assess the policy’s cost-effectiveness in three countries in sub-Saharan Africa: Angola, Tanzania and Uganda, each representing different prevalence/disease combinations. Our model includes country-specific epidemiologic, cost and behavioral data, including that of physician and caregiver. Our model is validated on malaria indicator surveys and country level data from each country’s National Malaria Control Program. We use a Markov specification to account for multiple fever episodes and estimate the incremental cost-effectiveness of the testing policy through two-stage micro-simulation models. These models capture key dimensions of uncertainty associated with our projections. RESULTS: We find that diagnostic testing for malaria is cost-saving in Angola. In Tanzania the cost per life-year gained is $5.54 and $94.58 in Uganda. Both are cost-effective compared to the WHO recommended policy. CONCLUSIONS: Our findings strongly suggest pursuit of policies that facilitate full implementation of testing, including promoting clinician adherence to test results.

PRM67 WHOLE-DISEASE MODEL APPROACH: METHODOLOGIES AND CHALLENGES IN COMMUNICATING THE ECONOMIC BURDEN OF RARE DISEASES Proach J.

Market Access Solutions LLC, Raritan, NJ, USA

OBJECTIVES: The concept of whole-disease model has rarely been applied in practice or considered in the published literature. No studies to date have addressed the applicability of this approach in rare diseases. This research aims to demonstrate the applicability, technique, and framework of the model designed to educate US Payers of the estimated patient-level resource utilization, diagnosis, costs, and year treatment cost from the US Payer’s perspective, a clinical guideline-based approach was developed. We reviewed diagnosis and treatment guideline recommendations to develop a resource utilization algorithm which was subsequently validated by clinicians to determine the coverage levels of each disease as a case study. METHODS: The lack of specific ICD-9 CM code, prevalence overestimation, poorly documented US epidemiology data, complex diagnostics, and off-label pharmacootherapy were evident in rare diseases. In order to estimate patient-level resource utilization, diagnosis costs, and year treatment cost from the US Payer’s perspective, a clinical guideline-based approach was developed. We reviewed diagnosis and treatment guideline recommendations to develop a resource utilization algorithm which was subsequently validated by clinicians to determine the coverage levels of each disease as a case study. RESULTS: Our findings are robust under varying cost, prevalence and behavioral assumptions. Probabilistic sensitivity analyses indicate that testing is cost-saving or cost-effective: 86% of the time. In the 59% in Uganda. CONCLUSIONS: Our findings strongly suggest pursuit of policies that facilitate full implementation of testing, including promoting clinician adherence to test results.