blood pressure 134.9±22.0 and total cholesterol of 189.8±48.7). The expected five-year cumulative MACE event rate was 9.2% and HbA1c reductions of 0.5%, 1.0% and 1.5% produced relative risk reductions of 7.5%, 9.0% and 10.6% respectively. At the 5% level, the number of patients required to detect a significant reduction in MACE events was 17,786, 11,758 and 9,192 for HbA1c reductions of 0.5%, 1.0% and 1.5% respectively. On average, each half-unit change in HbA1c required an additional 7,937 subjects to detect a significant difference in MACE event rate. CONCLUSIONS: Given the requirement to extensively validate health economic models in contemporary outcomes studies it is an obvious extension to use these models to inform on the design of clinical trials. These models offer considerable flexibility in the evaluation of sample size requirements in terms of expected changes in modifiable risk factors.

PM7/4 DEVELOPING REALISTIC PATHWAYS IN COST-EFFECTIVENESS MODELS FOR PSORIASIS: WHAT TO DO WHEN A BIOLOGICS ANAESTHETIST 
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OBJECTIVES: Clinical studies indicate switching to a biologic or combination therapy with an immunosuppressant after failure of first biologic can be effective in patients with moderate to severe plaque psoriasis not responding to the first biologic.

METHODS: A systematic literature review was performed to assess treatment pathways included in cost-effectiveness (CE) studies of biologics used to treat severe psoriasis and compare these pathways with those recommended in psoriasis treatment guidelines.

RESULTS: Thirteen CE modeling studies were identified. Of these, 10 estimated incremental cost per responder for 1RTI Health Solutions, Research Triangle Park, NC, USA, 2RTI Health Solutions, Manchester, UK, 3Novartis Pharmaceuticals Corporation, East Hanover, NJ, USA, 4Wake Forest University, Winston-Salem, NC, USA

OBJECTIVES: This simulation study evaluates the impact of Geomin and Target rotation methods in multi-group models using three- and four-factor single group models and four-factor conﬁrmatory factor analysis (CFA) in patient related outcomes measurement. By combining the steps of EFA and CFA in one uniﬁed approach, ESEM saves signiﬁcant time and effort usually invested in separate iterations of EFA and CFA.

METHODS: One simulation trial with 2,000 samples was carried out for each sample size and latent factors. Simulation study 1 examined the behavior of ESEM parameter estimates by changing the values of rotation constant (0.01, 0.001 and 0.0001) for Geomin rotations for each model with six factors in N = 300 and 1000. Simulation study 2 evaluated the behavior of ESEM parameter estimates for multi-group models using three- and four-factor models for N = 150 and 500 per group. Bias, Mean Square Errors (MSE) and standard errors were used to evaluate accuracy and parameter recovery of individual parameter estimates belonging to a pilot graduate creativity instrument.

RESULTS: For study 1, Geomin rotated parameter estimates of factor loadings, means and covariances produce highly similar values to the follow-up Target rotations. In study 2, the parameter estimates for ESEM Geomin show small sample size bias for some parameters while the standard errors produced correct coverage for all parameters under Target rotation method for large N = 500 per group. CONCLUSIONS: Overall, there was no substantial difference in model parameter estimates in the sample size of 300 especially in the multi-group models speciﬁcally when Geomin rotations were employed. This bodes well for analysis of real data and for the study of measurement invariance across groups. Future studies could include the examination of number of items affecting recovery of parameter estimates.

PM7/7 METHODOLOGICAL APPROACHES FOR MODELING CARDIOVASCULAR EVENTS IN COST-EFFECTIVENESS ANALYSES BASED ON OUTCOME TRIALS 
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OBJECTIVES: Historically, cardiovascular (CV) endpoints, including myocardial infarction and stroke, have often been included indirectly in cost-effectiveness analyses. As CV events are important outcomes from cardiovascular therapy to lower cholesterol levels, blood pressure or glycemic control. With the availability of outcome trials sufficiently powered to show differences in CV endpoints, there is an increasing need to incorporate these data directly into CEA. This study investigated the approaches available for modeling and evaluating CV endpoints directly based on outcomes data.

METHODS: A systematic review of cost-effectiveness models for cardiovascular interventions published in the past year was conducted in PubMed and Embase using a predefined search strategy. Only studies in English language directly integrating trial data on CV endpoints from randomized clinical trials were considered. For each study that met the inclusion criteria, clinical input characteristics and the modeling approach were summarized. Risk was assessed and evaluators called on whether decision makers there may be a need for more extensive models where such strategies are allowed.

PM7/5 DECISION ANALYTIC MODELS USED IN ESTIMATING THE COST-EFFECTIVENESS OF DRUG-ELUTING STENTS VERSUS BARE-METAL STENTS: A SYSTEMATIC REVIEW

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OBJECTIVES: Drug-eluting stents (DES) and bare-metal stents (BMS) are both used widely in the treatment of coronary artery interventions. However, the cost-effectiveness analyses of DES versus BMS conflict about whether the reduction in repeat revascularizations of DES versus BMS offsets the initial higher treatment costs of DES. A systematic review was therefore undertaken to examine whether modelling methods may influence the cost-effectiveness of DES versus BMS. METHODS: We reviewed modelling studies published until January 2012 that compared the costs and consequences of DES versus BMS. General information (e.g. funding) and modelling methods used, related to the framing of the economic evaluation (e.g. population and intervention characteristics, time horizon) and parameterisation of the models were extracted from the relevant studies for each of the individual analyses performed in the studies. Associations between these characteristics and the incremental costs and effectiveness were explored using regression analysis. We also examined whether the results were associated with the quality of the models based on the Philips et al. (2006) checklist. RESULTS: Fifteen eligible studies accounted for 498 separate analyses, in which the incremental cost-effectiveness ratios ranged from DES being dominated by BMS to DES being dominant. The most important predictors significantly associated with these differences were several population and procedure characteristics, funding and assumptions concerning stenting strategies. The results and conclusions of individual studies corresponded with the findings of this meta-level systematic review. Overall quality of the models was moderate (55±17%) and significantly negatively associated with repeat revascularizations avoided. CONCLUSIONS: Models are important to obtain valid estimates of the cost-effectiveness of DES versus BMS, and framing decisions (e.g. time horizon) and quality of the models both influence incremental costs and effects. The most important study assumptions were added within a systematic review and we showed the need of examining those parameters and of performing a quality check when interpreting the results.

PM7/6 EXPLORATORY STRUCTURAL EQUATION MODELS: A SIMULATION STUDY EXPLORING GEOMIN AND TARGET ROTATION TECHNIQUES ON VARIATIONS OF ESEM MODELS

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OBJECTIVES: This simulation study evaluates the impact of Geomin and Target rotation criteria on factor loading matrices in the recently developed exploratory structural equation models (ESEM), a method that can be considered a strong alternative to the exclusive use of a three-factor single group model and for conﬁrmatory factor analysis (CFA) in patient related outcomes measurement. By combining the steps of EFA and CFA in one uniﬁed approach, ESEM saves signiﬁcant time and effort usually invested in separate iterations of EFA and CFA.

METHODS: One simulation trial with 2,000 samples was carried out for each sample size and latent factors. Simulation study 1 examined the behavior of ESEM parameter estimates by changing the values of rotation constant (0.01, 0.001 and 0.0001) for Geomin rotations for each model with six factors in N = 300 and 1000. Simulation study 2 evaluated the behavior of ESEM parameter estimates for multi-group models using three- and four-factor models for N = 150 and 500 per group. Bias, Mean Square Errors (MSE) and standard errors were used to evaluate accuracy and parameter recovery of individual parameter estimates belonging to a pilot graduate creativity instrument.

RESULTS: For study 1, Geomin rotated parameter estimates of factor loadings, means and covariances produce highly similar values to the follow-up Target rotations. In study 2, the parameter estimates for ESEM Geomin show small sample size bias for some parameters while the standard errors produced correct coverage for all parameters under Target rotation method for large N = 500 per group. CONCLUSIONS: Overall, there was no substantial difference in model parameter estimates in the sample size of 300 especially in the multi-group models specifically when Geomin rotations were employed. This bodes well for analysis of real data and for the study of measurement invariance across groups. Future studies could include the examination of number of items affecting recovery of parameter estimates.

PM7/8 TOWARD SENSITIVITY ANALYSIS: SHOWING THE IMPACT OF CORRELATED PARAMETERS IN COST-EFFECTIVENESS ANALYSES

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OBJECTIVES: Correlated parameters are a common feature in economic models, but no standard sensitivity analysis (SA) exists to show their impact on cost-effectiveness. The one-way SA only varies one parameter at a time and ignores correlation while the probabilistic SA is typically used to address overall uncertainty. The objective of this study is to propose a standard method for visualising the impact of one variable consisting of two correlated parameters in cost-effectiveness analysis.

METHODS: A method evaluating the cost-effectiveness of a cancer product was used. Using the Cholesky decomposition, 1,000 correlated random draws were generated from the distributions of the intercept and slope of a linear function determining survival in the model. Each pair was inputted in the model to yield the percentage of simulations below accepted thresholds. Results were visualised using R in a scatter plot with both parameters on a separate axis. Shaded areas represented the percentage of simulations below accepted cost-effectiveness thresholds and the 95% CI. A one-way SA for the intercept and slope parameters was added. The method described above found that 78% of the simulated pairs resulted in ICERs below £20,000 per QALY gained, and 93% in ICERs below £30,000. The scatter plot visualised the combined uncertainty and their impact on the ICER. A limitation is that the visualisation only allows for 2 correlated parameters. Also, the use of R to generate the graph complicates incorporation of this SA in Excel models.

CONCLUSIONS: A method was demonstrated to show the impact of correlated parameters in cost-effectiveness analyses. This method may be especially helpful when assessing the uncertainty around parametric survival fits.