come countries. METHODS: We systematically reviewed the literature on the application of CVD risk models in pharmaco-economic studies. We assessed the quality of these models in these studies by evaluating the agreement of the population characteristics and the time horizon applied between the risk model and the pharmaco-economic study, the appropriateness of the risk model for the population studied, and the incorporation of the uncertainty of the risk model in their analysis. RESULTS: We identified 14 studies using published models of CVD risk models. The studies demonstrated the usefulness of projecting intermediate effectiveness endpoints to long term, health and cost related, benefits. However, our quality assessment highlighted the distance between the populations of the risk model and the studies reviewed, the disagreement between risk model and study time horizons, and the lack of consideration of all uncertainty surrounding risk predictions. CONCLUSIONS: Given that utilizing a risk model to project the effect of a pharmacological intervention to CVD events provides an estimate of the intervention’s clinical and economic impact, consideration should be paid on the agreement between the risk model and the studies reviewed as well as the uncertainty that these predictions add to the decision-analytic model. In the absence of hard endpoint trials, the value of risk models to model pharmacological efficacy in primary CVD prevention remains high, although their limitation should be acknowledged.

**PRM6**

**DEVELOPMENT OF A FRAMEWORK FOR COST-EFFECTIVENESS ANALYSIS**

**COHORT SIMULATION USING AN ORDINARY DIFFERENTIAL EQUATION SOLVER ALGORITHM IN R**

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OBJECTIVES: Dynamical processes in cost-effectiveness analysis (CEA) are typically described using Markov models that account for the full stochastic nature of the process, or alternatively using systems of ordinary differential equations (ODEs). In CEA, ODEs are useful for defining dynamical systems with complex, time-varying properties that often need to be considered, and are difficult to implement as Markov models. However, in the field of CEA, fixed step sizes (‘cycle lengths’) are used for solving systems of ODEs, which may result in bias if the step size is too large in relation to the magnitude of change. The aim of this project was to implement and demonstrate the use of a well established dynamical ODE solver algorithm (LSODA) for CEA in the statistical scripting language R, and to quantify bias in outcome caused by use of a fixed-step size cohort simulation approach.

METHODS: To demonstrate the proposed approach, a previously reported CEA on adjuvant breast cancer therapies was re-analysed using the ODE solver algorithm LSODA. A model implementing the fixed-cycle length method was also developed to compare bias by using a range of different cycle lengths. RESULTS: The CEA model was successfully developed using the ODE solver LSODA. The use of fixed cycle lengths resulted in bias compared to the outcome of the ODE model. A cycle length of 1 year resulted in an underestimation of 0.016 absolute LYs (5.6%) and €158 (6.8%) compared to the dynamical-step size model. CONCLUSIONS: The developed dynamical approach was found to be suitable for conduct of CEA’s and translation into practice. Moreover, it was demonstrated that use of fixed cycle lengths could potentially cause unnecessary bias in CEA outcomes. Finally, we advocate use of scripting languages such as R in the field of health economics to improve transparency, reproducibility and overall integrity of conducted CEs.

**PRM7**

**DEVIATION OF COMBINATION THERAPY IN RABBIT SPINE INJURY MODULAR MODEL**

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OBJECTIVES: To compare cost-effectiveness model input influence on incremental net monetary benefit (INMB) by using three methods of uncertainty analysis: 1) one-way sensitivity analysis; 2) probabilistic analysis of covariance (ANCOVA); and 3) expected value of partial perfect information (EVPPI). METHODS: We replicated and expanded a published HIV/AIDS cost-effectiveness Markov model (mono-therapy vs. combination therapy using TreeAge®. Case 1 assumed willingness-to-pay of £20,000/QALY (relatively low decision uncertainty in this application). Case 2 assumed a willingness-to-pay of £50,000/QALY (relatively high decision uncertainty). For Cases 1 and 2, one-way sensitivity analysis identified the ten most influential inputs. From these identification results, we estimated a Monte Carlo draws) and EVPPI for each input (1,000 inner and 1,000 outer draws). For each case and method, we ranked inputs based on their influence on variation of INMB and compared input ranks within case using Spearman’s rank correlation.

RESULTS: Mean INMB was £9,740 (Case 1) and £379 (Case 2) in favor of combination therapy. Case 1. The two most influential inputs were the same across all uncertainty methods, contributed 78% of variation in outcome (ANCOVA), and were the only inputs with non-zero EVPPI values. Case 2: All inputs had non-zero EVPPI values, with the two most influential inputs accounting for 49% of variation in outcome (ANCOVA). For Cases 1 and 2, the influential input rank order correlations across uncertainty methods ranged from 0.70 to 0.99 (all p-values < 0.05 for pairwise uncertainty method correlations for both cases). CONCLUSIONS: For both cases, the influential input ranks were positively correlated between one-way and multi-way uncertainty methods, thus enabling informed prioritization of modeling effort. Although each method provides unique information, the additional resources needed to generate and communicate advanced analyses should be weighed, especially when the outcome decision uncertainty and therefore value of information is low. (i.e. Case 1).

**PRM8**

**THE HALF-CYCLE "CORRECTION": HOW MUCH OF A CORRECTION IS IT?**

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OBJECTIVES: In economic models that use Markov-type processes, it is generally recommended that a ‘half-cycle correction’ be built into the analysis, to account for the fact that events can occur at any point during the cycle. This study explores the implications of the half-cycle correction, and highlights a number of flaws in the approach. METHODS: A brief review of health technology assessment models was undertaken to determine the use of half-cycle corrections. The study aimed to explore the theoretical, practical and mathematical implications of the half-cycle eye disorders characterized by VA impairment such as vitreomacular traction and macular hole.