come countries. METHODS: We systematically reviewed the literature on the application of CVD risk models in pharmaco-economic studies. We assessed the quality of the included models and the economic study using a high-quality methodological evaluation 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 the analysis. RESULTS: We identified 11 models using a number of different 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 represented by 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 risk model and study time horizons as well as the level of 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.

**PRM44 INCREASING LIFE EXPECTANCY: IMPLICATIONS FOR COST-EFFECTIVENESS ANALYSIS**

Majer IM, Heeg B
Pharmerit International, Rotterdam, Zuid-Holland, The Netherlands

OBJECTIVES: In developed countries, mortality in the general population has been declining for several decades and is anticipated to decrease further, especially among the elderly. Life tables based on national statistics reflect mortality conditions of a particular year and therefore do not take into account that survival increases in the general population. As a consequence, life tables seem to systematically overestimate overall survival of the general population. Health-economic models use life tables to predict survival of the general population and may therefore also underestimate survival. Our study compares survival prediction methods and discuss implications for health economic models. METHODS: Period life expectancy at age 50 calculated from Dutch mortality rates published for 2009 was compared with life expectancy of a cohort aged 50 in 2009 calculated from projected mortality rates forecasted by the standard Lee-Carter approach. The Lee-Carter model forecasts the level and age pattern of mortality based on the combination of mortality composition of deaths and time series mortality. Mortality rates were taken from the Human Mortality Database. Projectons were based on historical data between 1970 and 2009. RESULTS: Based on projected mortality, cohort life expectancy was 34.97 years whereas period life expectancy was only 32.37 years (2–60 years). When life years were discounted at a 1.5% rate, the corresponding values were 25.31 and 26.40 years (1–109 years). CONCLUSIONS: The analyses show that taking into account the decrease in survival over time results in a difference of 7% in undiscounted and 4% in discounted life expectancy in the Netherlands. This difference can have a substantial impact on cost-effectiveness results, especially of curative interventions for diseases that are life threatening or prevention programmes over a long time horizon. In these cases, sensitivity analysis should be carried out to investigate the impact of decreasing mortality.

**PRM45 UTILITY ESTIMATION FOR VISUAL ACUITY HEALTH STATES: AN ORIGINAL APPROACH TO TRANSPORT PUBLISHED EVIDENCE INTO A MORE FLEXIBLE ESTIMATION**

Bennison C1, Thurston S2, Lescrauw B2, Bojakowski S3, Kozmi-Zaiebe S4
1Pharmerit International, York, UK, 2Pharmerit Ltd, York, UK, 3Xitriser Consulting, Leuven, Belgium, 4ThomsonCorics NV, Neverlee, Belgium

OBJECTIVES: The NICE reference case stipulates cost-utility analysis as the preferred form of economic evaluation, with health effects expressed in QALYs and health states valued using a validated choice-based method such as the time-trade-off (TTO). The evidence-base describing the impact of visual impairment (VI) on quality-of-life is very limited. To date, the Czeck-Murray et al. (2009) utility values for 4 visual health severity groups are considered the most plausible set of utility values for use in eye-disorder economic models. These utility values, originally elicited through simulating VI similar to that associated with late age-related macular degeneration, were recently applied in other retinal disorders such as diabetic macular edema. The objective of our analysis was to refine the mapping of utilities onto visual acuity (VA). METHODS: OLS regression models were built to estimate the relationship between mid-point VA of 4 visual health severity groups and mean TTO scores as described in the literature. Linear and non-linear approaches for utility estimation as a function of the number of VA letters were explored. RESULTS: The linear regression for utility estimation was found to be statistically significant. The beta-coefficient for mid-point VA was 0.0054 (p=0.030) and 0.2864 for the constant term (p=0.034). Linear regression estimates were used to predict utility values. Mean TTO values were calculated for a number of VA. CONCLUSIONS: Published evidence on utility values for deterministic visual health severity groups may not easily transpose to alternative vision health-states. Our analysis demonstrated an original approach for utility estimation allowing a more flexible and robust method to map previously elicited VA-associated utilities onto alternate VA health-states. This method allows wider applicability of VA-associated utility estimation in other eye disorders characterized by VA impairment such as vitreomacular traction and macular hole.

**PRM46 DEVELOPMENT OF A FRAMEWORK FOR COST-EFFECTIVENESS ANALYSIS SIMULATION USING AN ORDINARY DIFFERENTIAL EQUATION SOLVER ALGORITHM IN R**

Frederix GW1, van Hasselt JC2, Severens JL3, Hövels AM3, Huitema AD3, Raaijmakers JA3
1Netherlands Cancer Institute, Amsterdam, The Netherlands, The Netherlands, 2Slootvaart Hospital/Netherlands Cancer Institute, Amsterdam, The Netherlands, The Netherlands, 3Erasmus University Rotterdam, Rotterdam, The Netherlands, The Netherlands, 4Utrecht University, Utrecht, The Netherlands, 5Slootvaart Hospital/Netherlands Cancer Institute, Amsterdam, The Netherlands, The Netherlands, 6Utrecht University & GlassmanSmithKline, Utrecht, The Netherlands, 7Netherlands Cancer Institute & Erasmus University, Rotterdam, The Netherlands

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 CEs, 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 CEs in the statistical scripting language R, and to quantify bias in outcome caused by use of a fixed-size step cycle 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 feasible to implement. 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.

**PRM47 COST-EFFECTIVENESS UNCERTAINTY ANALYSIS METHODS: A COMPARISON OF ONE-WAY SENSITIVITY, ANALYSIS OF COVARIANCE, AND EXPECTED VALUE OF PARTIAL PERFECT INFORMATION**

Campbell J1, McQuoid RB2, Libby AM2, Sparkman E2, Carlson J3, Briggs A1
1University of Colorado, Aurora, CO, USA, 2University of Colorado, Denver, Aurora, CO, USA, 3University of York, Heslington, North Yorkshire, UK, 4University of Washington, Seattle, WA, USA, 5University of Glasgow, Glasgow, UK

OBJECTIVES: To compare cost-effectiveness model input influence on incremental net monetary benefit (INMB) between three methods of uncertainty analysis: 1) one-way sensitivity analysis; 2) probabilistic analysis of covariance (ANCOVA); and 3) expected value of partial perfect information (EVPI). METHODS: We replicated and expanded a published HIV/AIDS cost-effectiveness Markov model (mono-therapy using combination therapy) using TreeAge®. Case 1 assumed willingness-to-pay of £8,000/QALY (relatively high decision uncertainty) and Case 2 assumed willingness-to-pay of £20,000/QALY (relatively low decision uncertainty in this application). RESULTS: Mean INMB was £9,740 (Case 1) and £179 (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 EVPI values. Case 2: All inputs had non-zero EVPI 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 analyses, indicating influential input agreement. 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).

**PRM48 THE HALF-CYCLE "CORRECTION": HOW MUCH OF A CORRECTION IS IT?**

Taylor M, Lewis I
University of York, York, UK

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