years (QALYs). Thus, considerations on QoL outcomes in the clinical trial design phase may lead to better optimized reimbursement submissions. The objective of this study was to develop a trial simulation model that is capable of addressing complex research questions, provides flexibility to test various assumptions, and predicts expected QALY outcomes. **METHODS:** A patient-level simulation model was developed using hypothetical data in oncology. The model considered two treatments reflecting the common design of a pivotal trial. Individual survival times and time to progression data were simulated. Hazard ratios were used to include treatment effects. Using the simulated individual level data, a multistate life table model was constructed with three health states: pre-progression (with and without adverse events), post-progression, and dead. Utility and disutility values derived from literature were attached to the number of patients in each health state at a given point in time. Differences between the treatment arms were derived in terms of survival, QALYs, and the uncertainty around those (e.g. probability distribution, P-value). **RESULTS:** The trial simulation model assessed various patient number scenarios to obtain the smallest sample size that provided a statistically significant minimum clinically meaningful QALY difference between the treatments. Simulations were performed (e.g. testing the effect of different survival profile scenarios, utility values) to assess the robustness of the results. **CONCLUSIONS:** The presented trial simulation model provided a flexible tool to inform clinical trial design considering QoL outcomes. The model can be also useful for manufacturers for pricing or investment decisions.

PRM96

SYSTEMATIC REVIEW OF MATHEMATICAL MODELS PREDICTING RELATIVE EFFECTIVENESS

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OBJECTIVES: To identify and assess mathematical models predicting the relative effectiveness of drug treatments in "real world" populations, based on data from randomized control trials and other sources of evidence. **METHODS:** Systematic review of mathematical modelling studies addressing the step from relative efficacy to relative effectiveness. We identified eligible studies through electronic and manual searches of MEDLINE and EMBASE databases, selected websites and reference lists of relevant papers. Two reviewers screened the articles independently and extracted study characteristics such as model type, disease area, validation and software used via an extraction form. **RESULTS:** Eight papers met the inclusion criteria covering four broad modelling approaches: multi-state models, simulation-based approaches, mechanistic models, and classical regression based models. The multi-state models were the predominant class of models. These models are defined as time-dependent stochastic processes with discrete event space. Most examples belonged to the special case of Markov multi-state models. Multi-state models were applied at the level of population groups or at the individual patient level. The other approaches we identified were less frequent. Discrete event simulation was used in one paper. This approach is entirely based on simulations. One article described a mechanistic model based on ordinary differential equations, which are typically derived from biological knowledge and first principles. Finally, more classical regression techniques from survival analysis were used in two papers. Six articles included models built for cardiovascular indications, the remaining ones covered oncology and neurosciences. Internal or external model validation was presented in six papers, while two papers considered only sensitivity analysis to evaluate the model performance. **CONCLUSIONS:** This review shows the range of models currently used for predicting the relative effectiveness of drug interventions in real world patient populations. They complement the available tools for evidence synthesis in comparative effectiveness research.

PRM97

COST-EFFECTIVENESS ANALYSIS OF AN ANTIMICROBIAL TRANSPARENT DRESSING FOR PROTECTING CENTRAL VASCULAR ACCESSES IN CRITICALLY ILL PATIENTS VERSUS STANDARD TRANSPARENT DRESSINGS IN FRANCE: A COMPARISON OF TWO MODELING APPROACHES: DECISION-TREE VERSUS NON-HOMOGENEOUS MARKOV MODEL

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OBJECTIVES: To perform cost-effectiveness analysis (CEA) for routine use of a transparent dressing integrating a chlorhexidine gluconate (CHG) -containing gel pad versus standard transparent dressings, with a classical decision tree model and a Non-Homogeneous Markov Model (NHMM) previously developed. **METHODS:** Clinical efficacy data was extracted from a multicentre randomized controlled trial (RCT) with 1,879 patients and economical data obtained from micro and macro-costing published studies. The baseline method is a NHMM previously developed in Microsoft Excel® with VBA using the same data sources. The decision tree was built with the TreeAge Pro® software 2013. One-way deterministic (DSA) and probabilistic sensitivity (PSA) analyses were conducted on key clinical and economic parameters. **RESULTS:** Based on the decision-tree model, the CHG-dressing is a dominant strategy compared to standard dressings. The intervention prevents 13.5 infections per 1,000 patients and saves €157 per patient. These results are robust across a range of values for several parameters in DSA. The PSA with the NHMM resulted in 11.8 infections avoided per 1,000 patients (95%CI: [3.85; 19.64)]) and a mean extra cost of €141 per patient (95%CI: [€-975; €1,258]) when using antimicrobial dressing. Effectiveness as calculated by both models is similar while cost estimations diverge. **CONCLUSIONS:** Decision-tree and the NHMM are structurally different and even though their outcomes cannot be directly compared, they were coherent. The decision-tree model indicates that CHG-dressings are cost-saving and a dominant preventative strategy for CRBSIs. The Markov model supports cost-effectiveness compared to standard dressing. The main disadvantages of the decision-tree are the inability to integrate changes among health states during the ICU stay and to simulate possible observable trajectories in the patient history. The structure of the non-homogeneous Markov model does not allow DSA for the incidence of the disease.

PRM98

HEALTH ECONOMIC EVALUATION OF DIAGNOSTIC AND PROGNOSTIC PREDICTION MODELS. A SYSTEMATIC REVIEW

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OBJECTIVES: The aim of this study is to provide an overview of the quality of health economic evaluations (HEEs) of prediction models, the evidence used, and the challenges. **METHODS:** The databases Medline, Embase, Econlit, and the NHS Economic Evaluations Database were systematically searched for HEEs of diagnostic and prognostic risk prediction models. The included HEEs were evaluated on their methodological quality using the Drummond checklist. Furthermore, an item list was developed incorporating descriptive items on the HEE, specific items on the HEE of prediction models, and statistical characteristics of the prediction model that could be incorporated into the evaluation. **RESULTS:** The database search resulted in 791 unique papers, from which 653 were excluded based on abstract. After assessing full texts, 17 HEEs (all cost-utility studies) were included. A prediction model was compared to current practice in 11 HEEs and to an extended prediction model in 6 HEEs. On a 35-point scale the quality score ranged from 17 to 32 (median 25). In 7 papers there was no overlap between authors of the initial prediction model paper and those of the corresponding HEE. In 5 papers individuals were classified based on a single (set of) threshold(s); based on guidelines in 4 papers and once on expert opinion. In 8 papers the classification threshold was optimized in the CEA itself. A probabilistic sensitivity analysis was not included in 7 papers and uncertainty around predicted risks was only taken into account once. **CONCLUSIONS:** In most papers limited (prediction model) details were available. Potentially due to this lack of evidence and a lack of specific guidelines on HEE of prediction models, a large variety in the quality and methodology was observed. This variation may complicate the validation and interpretation of HEE results and thereby the decision making on implementation of prediction models in practice.

PRM99

MIGRATION OF HEALTH ECONOMICS MODELS TO WEB AND MOBILE ENVIRONMENTS. WHY SHOULD MODELS GO WEB?

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OBJECTIVES: To understand the key functional differences between conventional cost-effectiveness Excel and web based model types. **METHODS:** An online survey consisting 18 end users and 5 model owners (n=23) was conducted. Respondents were asked to rate key criteria of both model types on a scale from 0 to 10. Model types were compared with the following 13 criterias: model execution speed and size, general functionality support, accessibility, usability, model management and versioning, ease of localization, ease of model core modification, sharing, review process, usage analytics, integration with other content. No weighting to the scoring across criteria was applied. **RESULTS:** Results of the survey indicate that web based models outperform standalone models in 10 of the 13 criteria assessed. Model review process, ease of model core modification and execution speed was rated higher for conventional standalone Excel models. 80% of model owners and 78% of model users assigned higher overall score for web based models compared to Excel models. **CONCLUSIONS:** Web based models offer advantages primarily related to model usage and lifecycle management. These models can be viewed on any hardware device or browser, thus overcoming the limitations of Excel models. The use of latest web technologies such as JavaScript, HTML5 and CSS3 improve user experience in model adaptation and presentation to end audience. Usage analytics, smart versioning, web sharing and automatic updates are the functional advantages that can not be achieved with conventional Excel models due to technical limitations.

PRM100

VALIDATING A MODEL TO PREDICT DISEASE PROGRESSION OUTCOMES IN PATIENTS WITH COPD

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OBJECTIVES: To validate a model for quantifying the COPD disease progression against both the data used to generate the model (internal validation) and clinical trial data not used in the model's development (external validation). **METHODS:** A model representing causal relationships between central disease attributes (lung function, exacerbations, symptoms and exercise capacity) and final outcomes (survival, quality of life, cost) was developed based on the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) study dataset. Model predicted annual outcomes were compared to the corresponding annual observed data from ECLIPSE (n=2,164) and TOwards a Revolution in COPD Health (TORCH) (n=6,108) trials based on fitting the model baseline parameters to reflect each specific study population. **RESULTS:** The model accurately predicted the ECLIPSE outcomes in at least two of the three annual time points within the 95% confidence interval (CI) of the observed data for survival, FEV1% predicted, and annual exacerbations (per patient per year [PPPY]. The model predicted 9.0 metres annual decline in Six Minute Walk Distance compared to ECLIPSE observed data of 5.7 metres decline. The model accurately predicted the TORCH placebo outcomes in at least two of the three annual time points within the 95%CI of the observed data for FEV decline and annual exacerbations PPPY. The model over predicted survival by 8% (absolute) compared to TORCH observed data at year 3. **CONCLUSIONS:** As expected, the model more accurately predicted the ECLIPSE observed outcomes in the internal validation exercise, than TORCH outcomes in the external validation.