PROCDIM is a valuable tool to capture several patients reported outcomes and data for chronic disease management. Such tools could be used for collecting data for disease management, clinical trial and for observational studies for various chronic diseases.

PRM6

VALIDATING AN ALTERNATIVE WEIGHTING ALGORITHM OF THE CHARLSON COMORBIDITY INDEX (CCI) FOR RISK ADJUSTMENT IN PREVIOUSLY HOSPITALIZED PATIENTS

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OBJECTIVES: To validate an alternative weighting algorithm of the Charlson Comorbidity Index (CCI) for the prediction of health care expenditures and utilization in previously hospitalized patients. **METHODS:** Data from the Medical Expenditure Panel Survey (MEPS) Panel 12 (2007-2008) were retrieved for this retrospective cohort study. Two CCI scores were calculated for patients who were hospitalized in 2007: one based on the original weights (Charlson-CCI) and the other based on the weights updated by Quan et al. (Quan-CCI) [both were developed to predict mortality]. Adjusted R2 from linear regression models were used to estimate log-transformed healthcare expenditures (COST) in 2008. Odds ratios and c statistics from logistic regression models were used to compare the predictive power of the risk of hospitalizations (≥ 1 admission), risk of emergency department visits (≥ 1 visit), and high expenditures (≥ 90th percentile of COST) in 2008. **RESULTS:** Seven hundred patients who had been previously hospitalized were included in the study. The mean (SD) age was 52.5 (15.3) years, and 65% were female. In the linear regressions, the Charlson-CCI explained more variance in COST than the Quan-CCI (adjusted R2 = 20.7% vs. 19.9%), adjusting for age and sex. The Charlson-CCI was a better predictor of the risk of emergency department visits (c=0.600) than the Quan-CCI (c=0.571). Compared with the Quan-CCI, the Charlson-CCI showed better discriminatory power for the prediction of high-expenditure individuals (c=0.770 vs. 0.743) and the risk of hospitalizations (c=0.589 vs. 0.581). The Quan-CCI did not significantly predict high-expenditure individuals (OR=1.15; 95% CI=0.99-1.33) or the risk of hospitalizations (OR=1.14; 95% CI=0.99-1.30). **CONCLUSIONS:** In a group of previously hospitalized patients, the original CCI exhibited better discrimination for the prediction of healthcare expenditures, hospitalizations, and emergency department visits. The weights updated by Quan et al. were developed to predict mortality and may have limited utility in predicting health care utilization.

Research On Methods – Cost Methods

PRM7

USING PROBABALISTIC SENSITIVITY ANALYSIS IN BUDGET IMPACT MODELS TO REDUCE UNCERTAINTY AND IMPROVE DECISION-MAKING

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OBJECTIVES: Budget impact analysis (BIA) is formally required by many national HTA regulatory agencies including NICE and the PBAC, in the UK and Australia, respectively. Current practice only involves the use of point estimates to serve as "best guess" for decision-makers. However, using probabilistic sensitivity analysis (PSA) can serve to reduce parameter uncertainty in order to generate discussion and ultimately improve decision-making. **METHODS:** Using the same techniques applied to cost-effectiveness analysis, a PSA was incorporated into a budget impact model used for a client's medical device. This involved creating and running a Monte-Carlo simulation (MCS) over 10,000 iterations to generate a 95% confidence interval (CI) around the overall budget impact in addition to a probability curve. **RESULTS:** Point-estimate budget impact was found to be a saving of £4,736,893 based on a number of pre-defined input parameters in the model. Running a MCS generated a 95% CI: a saving of £10,367,403 and an incremental cost of £861,166 either side of the point-estimate. In addition, a probability curve was generated with overall budget impact on the x-axis and probability on the y-axis. 25 data points were generated running from a maximum potential saving of approximately £12m (1% probability) to an incremental cost of approximately £3m (100% probability). **CONCLUSIONS:** Using PSA in this budget impact model demonstrates that there is a significant likelihood this medical device could actually generate an incremental cost rather than saving (which the point-estimate shows). This serves as an example of how using this technique could serve to generate discussion among decision-makers in order to make more informed and improved budget impact decisions in the future.

PRM8

COULD CORPORATE SOCIAL RESPONSIBILITY PREDICT PHARMACEUTICAL CORPORATE FINANCIAL PERFORMANCE?

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OBJECTIVES: 1) To quantify CSR concept by developing a pharmaceutical companies namely Auamnoy's visual analogue scales—a 24 measurement indicators in 6 dimensions to make a composite variate; 2) To perform a retrospective research to explore relationship between CSR activities and corporate financial performance (CFP); and 3) To discover prediction model to predict pharmaceutical CFP by CSR. **METHODS:** Challenging literature reviews were executed on and on to find the valid and reliable scales to measure CSR. Twelve appropriate CFP indicators were discussed and then selected to evaluate 43 pharmaceutical companies performance. The α value was set at 0.05, one side using SPSS version 17.0 to calculate all statistical analysis. **RESULTS:** The six dimensions Auamnoy's scales were Drug development, Patients, Environment and safety, Social issues, Philanthropy and Business ethics and – yielded acceptable Cronbach's alpha 0.7415, 0.7154, 0.7151, 0.7426, 0.7217 and 0.7466 respectively. Pearson's product moment correlation confirmed that CSR showed a significant positive correlated with (ROI, Sales, EPS, DPS, BV, %Sales Growth, %ROA and %ROI) (r=+0.832, +0.489, +0.789, +0.631, +0.351, +0.298, +0.455, +0.336, p=0.000, 0.000, 0.000, 0.000, 0.011, 0.030, 0.001, 0.008 respectively). Finally, Regression analysis estimated significant seven models of pharmaceutical CFP–ROI, Sales, EPS, DPS, BV, %ROA and %ROI by CSR. **CONCLUSIONS:** The answer was yes, pharmaceutical CSR could predict CFP. The more the pharmaceutical companies invested in CSR. the more CFP they obtained.

PRM9

WHAT GUIDANCE IS AVAILABLE FOR BUDGET IMPACT ANALYSIS?

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OBJECTIVES: There is a wealth of literature and guidance available for cost-effectiveness research, but the guidance available on budget impact analysis (BIA) is less familiar to many investigators. In times of increased budget constraint, however, the importance and popularity of BIA is growing. The objective of this review was to assess whether guidance on BIA methodology is available and consistent. **METHODS:** Online searches were performed to identify published guidelines or recommendations on BIA from any country. The guidelines were then reviewed for whether they gave advice on certain pre-determined methodological categories. **RESULTS:** National guidelines have been produced in Canada, Ireland, Scotland and Poland specifically on how BIA in each of these countries should be performed. Other countries such as the UK, Italy and Hungary include recommendations on BIA within guidelines on health care economic assessment, but their focus is largely on cost-effectiveness analysis. The national guidelines were consistent in whether they made recommendations on perspective and time horizon, but varied in whether they gave advice on market share determination, sources of costs, inclusion of treatment of adverse events and the presentation of resource use and costs separately. The definition of the term 'incremental BIA' was also used inconsistently. An ISPOR Task Force has produced international guidance for budget impact methodologies, which is designed to support national guidelines rather than supersede them and also to improve consistency across BIAs developed for different settings. **CONCLUSIONS:** Several national and international bodies have developed guidelines or tools for developing and reporting budget impact models. However, different specifications exist and not all methodological aspects are made explicit in every case. Consensus guidelines such as those produced by the ISPOR task force are required to shape future national BIA recommendations.

PRM10

TO GET THE RIGHT PRICE – A DECISION SUPPORT METHOD TO OPTIMIZE MANAGERIAL DECISIONS ON PUBLIC FUNDING PRICE TO APPLY FOR

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OBJECTIVES: In challenging economic times public funding decision makers are getting tougher, so the managers have to be smarter to choose the right price and optimally justify it. The objective is to present our method which rationally supports managerial decisions on pricing in public funding. **METHODS:** The decision support method consists of the following steps: 1) identify all arguments relevant to different price levels – e.g. based on prices of similar drugs that were accepted by public payer or related to prices of the drug in other countries; 2) calculate maximum price that may be justified with each piece of an argument; 3) sort arguments in price ascending order; 4) rank arguments in a pairwise manner against their impact on probability of public funding acceptance using 5-point Likert scale; 5) plot all arguments on a graph with price level on X axis and cumulative impact on probability of acceptance on Y axis; and 6) calculate first derivative to identify local maxima. The seventh step is the manager's decision on choosing the right price from the subset of local maxima. Local maxima represent the price levels for which a relatively large increase in price associates with a relatively small decrease in acceptance for public funding. **RESULTS:** The decision support analysis results in a subset of price levels that the manager is recommended to choose the right price from. The final choice may depend on acceptance/avoidance of risk or necessity to achieve a specific turnover. All arguments that justify the chosen and higher prices may be used to justify this price to public funding decision makers. **CONCLUSIONS:** To ensure a pricing success to their companies and their own career development Market Access managers should use the presented decision support method to make possibly best informed choices concerning official prices of their drugs.

PRM11

LEARNING EFFECT IN ECONOMIC EVALUATIONS OF HEALTH CARE INTERVENTIONS

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OBJECTIVES: The presence of the learning effect has an impact on the effectiveness of health technologies and so, it is relevant to capture this in an economic analysis. The aim of this study is to explore the bibliography of learning curves in health care economic evaluations. **METHODS:** In order to understand the bibliography of learning curves in economic evaluations, a systematic review was conducted to identify economic analyses that include a formal description of a learning effect. The following databases were searched: Medline, Medline (R), Embase, EconLIT, HEED and NHS EED. For a study to be included in the review, it had to be an economic evaluation defined as a cost, utility or cost-effectiveness study. In addition, the study also had to formally analyse the learning effect by using statistical analysis, graphs or tables. All non-human and non-English studies were also ex-

cluded from the review. The studies included were categorised based on criteria such as type of study, statistical methods for the learning effect, mathematical framework for the economic analysis, year of publication, country and intervention. **RESULTS:** The database search produced 930 articles. Only 2% of the studies obtained were included given the above criteria. Of the excluded studies, 70% were excluded as they were not economic evaluations and 23% were excluded as they did not formally present the learning effect. The remaining 7% were excluded based on other reasons: duplicates, non-English, non-human. The majority of the studies are published after 2000. Of the included studies, the majority presented a learning effect related to health care costs. Two percent of the included studies referred to utilities. Only one study synthesised cost and utilities. **CONCLUSIONS:** Although the learning effect can have a notable impact on the effectiveness of health care interventions, the economic evaluation literature on the subject is very limited.

PRM12

AN APPLICATION OF A PROPOSED FRAMEWORK FOR FORMULARY LISTING IN LOW-INCOME COUNTRIES: CASE OF CÔTE D'IVOIRE

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OBJECTIVES: The Mutuelle Générale des Fonctionnaires et Agents de l'État de Côte d'Ivoire (MUGEFCI) is a health mutual providing coverage services for its enrolees (medical consultations, lab tests, medication expenses). This organization aims at improving its current drug reimbursement process because of budgetary constraints. This study, therefore, aims at evaluating the feasibility of developing a new formulary for the MUGEFCI in Côte d'Ivoire, by implementing a formulary-listing framework specifically designed for under researched settings. **METHODS:** The application of this framework, based on Multi-criteria Decision Analysis (MCDA), consisted in four steps. First of all, we identified and weighted relevant formulary listing criteria with their levels of variation. Then, we determined a set of priority diagnostic/treatments to be assessed. Furthermore, scores were assigned to these treatments according to their performance on the formulary listing criteria levels. Last, we constructed a composite league table to rank the set of treatments by priority order of reimbursement. A budget impact analysis was also conducted to appraise the economic implications of the new composite drugs league table. **RESULTS:** Policymakers in Côte d'Ivoire consider targeting cost-effectiveness and severity of diseases as the most significant criteria for priority reimbursement of drugs. This translates into a general preference for antimalarial, treatments for asthma and antibiotics for urinary infection. Moreover, the results of the BIA suggest that the new priority list of reimbursable drugs will be affordable when the real economic impact of drugs per patient is under 66 US dollars. Over this threshold, the MUGEFCI will have to select the reimbursable drugs according to their rank in the priority list along with their respective budget impact per patient (cost per patient). **CONCLUSIONS:** It is feasible to use MCDA to establish a formulary for low-income countries. The application of this method is a step forward to transparency in policymaking.

PRM13

ASSESSING THE METHODS FOR SYSTEMATIC REVIEWS OF ECONOMIC EVALUATIONS

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OBJECTIVES: Robust and explicit methods to conduct systematic reviews of economic evaluations are required to guarantee quality of reviews and their findings. This is especially needed when assessing high resource-consuming topics such as those related to the introduction of new imaging technologies. Our aim is to analyse the methods for systematic reviews of economic evaluations of health technologies. **METHODS:** We carried out a systematic review of methods for systematic reviews of economic evaluations by reading relevant parts of HTA methodological manuals ("manuals") and HTA reports from UK ("reports") in English and Italian at September 2010. **RESULTS:** We identified 27 manuals and 53 potential reports. Among them, 6 and 40 contained relevant information respectively. None of the 6 manuals described the criteria used for the identification or formulation of the methods, or gave guidance on which method to follow. Among the 40 reports included, 38/40 (95%) reports described search strategy and data bases used to identify studies and inclusion criteria were presented in 21/40 (53%) reports. The reports did not use a study quality assessment instrument were 9/40 (22.5%) while 20 different instruments were identified in the remaining reports. No report carried out a quantitative synthesis of the data from the systematic review and 9/40 reports (22.5%) clearly stated this. The reports that appear to include the data selectively in their economic evaluation were 13/40 (32.5%). **CONCLUSIONS:** The absence of clear methodological guidance in manuals is reflected in the reports. These show unclear rationale, methods and use of data from systematic reviews of economic evaluations.

Research On Methods – Databases & Management Methods

PRM14

MONDRIAAN: A DUTCH 'POPULATION' LABORATORY

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OBJECTIVES: Many excellent health care databases are available in The Netherlands for (pharmaco-)epidemiologic research. However, in isolation these data remain scattered and have limitations with regard to sample sizes and/or detail of the registered information.The objective of Mondriaan is to optimize access to en linkage of routine health care databases in the The Netherlands for (pharmaco-)epidemiologic research. **METHODS:** We have built an ICT infrastructure for collection and linkage of healthcare/research data in The Netherlands. To protect privacy, pseudonimisation and linkage is performed by a trusted third party (TTP). A data catalogue on subject level has been developed to allow queries within the integrated databases to support designing (pharmaco-) epidemiologic studies (incl. sample size calculations, assessment of completeness of data). **RESULTS:** We are able to routinely link all pharmacy records from the National Foundation of Pharmaceutical Statistics (SFK) (n>14,000,000) on a patient base to several routine health care databases such as the Almere Health Care database (n=200,000), the Julius GP Network (n=200,000), and the AGIS claims database (n=1,200,000). Currently we are integrating several other databases in the The Netherlands. **CONCLUSIONS:** The project will deliver a large-scale, high-quality data platform for innovative (pharmaco-)epidemiologic research.

PRM15

THE OUTCOME OF ISPOR EUROPEAN AND INTERNATIONAL CONGRESSES BETWEEN 2005-2009

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OBJECTIVES: Many of the former socialist countries of Central and Eastern Europe (CCEE) joined to the European Union in 2004. The aim of this study is to analyse to outcome of ISPOR European and international congresses between 2005-2009 with a special respect to the activity of CCEE. **METHODS:** We analysed the abstracts presented at the ISPOR European or International cogresses and published in the Value in Health journal between 2005-2009. We performed a database analysis of value in Health journal on the Web of Science (Thomson Reuters) electronic database of scientific publications. Three indicators were selected: author's country, institution (university) and name. **RESULTS:** The top-10 most active countries were (abstract/1 million population): Switzerland (48.3), Wales (31.0), Sweden (26.2), Denmark (25.3), Belgium (25.0), The Netherlands (23.0), England (19.3), Canada (18.3), Scotland (16.0) and Hungary (14.7). Furthermore Slovakia (8.2) was ranked 16th, Czech Republic (5.0) 24th, Poland (4.1) 26th and Serbia (3.3) 29th. The top-10 most active universities were (number of abstracts): Univ So Calif (140), Univ Toronto (107), Univ Washington (100), Ohio State Univ (98), Erasmus Univ & MC (94), Univ Maryland (93), Univ Pécs Hungary (93), Univ York (92), Harvard Univ (89) and McMaster Univ (76). Three more CCEE university were ranked: Med Univ Warsaw from Poland (38), Corvinus Univ Budapest from Hungary (30) and Comenius Univ from Slovakia (27). The most active 10 authors were (number of abstracts): Boncz, I (Hungary, 96), Taieb, C (France, 83), Balkrishnan, R (USA, Ohio, 77), Sebestyén, A (Hungary, 71), Valentine, WJ (Switzerland, 65), Mantovani, LG (Italy, 60), Caro, JJ (USA, MA, 57), Annemans, L (Belgium, 54), Kriszbahcer, I (Hungary, 52), Rejas, J (Spain, 50). **CONCLUSIONS:** Former socialist countries of Central and Eastern Europe (CCEE) showed a significant activity at ISPOR European and International congresses.

Research On Methods – Modeling Methods

PRM16

COVARIANCE STRUCTURES FOR MODELING LONGITUDINAL DATA

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OBJECTIVES: The objective of this analysis is to compare several covariance structures which are used in the modeling of longitudinal data. **METHODS:** A PUBMED search reveals is a steady increase in prospective observational studies over the past five years. Repeated measures models are frequently used to analyze longitudinal data. For the purpose of these comparisons, a series of longitudinal datasets are simulated. In order to facilitate comparisons with applications to longitudinal datasets involving utilities; the dependent variable in the simulation datasets is a continuous variable restricted to the support interval [0, 1]. The predictor variables include a set of categorical and continuous variables, including a time varying covariate. Datasets with four different types of time dependence were compared (no time trend, log time trend, linear trend, exponential trend). Models with the following covariance structures were evaluated: compound symmetry, unstructured, autoregressive, heterogeneous autoregressive, variance components and toeplitz. Model comparisons were based upon Akaike information criteria (AIC) and the Bayesian information criteria (BIC). **RESULTS:** The preferred covariance structures for the dataset without a time trend were heterogeneous autoregressive (AIC) and unstructured (BIC). The preferred covariance structure for the log trend dataset was unstructured (AIC and BIC). The preferred covariance structures for the linear trend dataset were variance components (AIC) and heterogeneous autoregressive (BIC). The preferred covariance structure for the exponential trend dataset was variance components (AIC and BIC). **CONCLUSIONS:** The unstructured covariance matrix is often the default choice for the covariance matrix for longitudinal models. This model has the least number of assumptions and allows for the modeling of each patient individually. However, the unstructured covariance structure requires the most degrees of freedom and in some cases the estimated covariance matrix does not converge. In these cases, covariance structures such as variance components and heterogeneous autoregressive may present attractive options.

PRM17

SUITABILITY OF CLAD-CQR MODELS FOR OBTAINING QALYS

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