Centrivity are compared with national US data (NHANES, NHIS, Kaiser Family Foundation and Census) including demographics and two common diseases, hypertension and diabetes. Data from 2004 and 2005 are used for all comparisons. EMR data is included for all patients with activity in 2005. ICD-9 codes were used to identify patients. FBG levels were used in NHANES patients for diabetes. RESULTS: In total, 3,127,682 EMR patients were available; 2,644,181 of these were 18 and older. EMR population was older than the general US population. A percentage of EMR patients was lower in <18 and 18–44, and higher in 45–64, 65–74, and 75+. EMR patients had predominantly commercial insurance (73.0%) and those with Medicare were lower and Medicare higher than the US population. Racial distribution was similar with EMR having a lower percentage of white patients (78.8%, 81.0%) and a higher percentage of black patients (13.5%, 12.7%). EMR patients were overrepresented in the Northeast and Midwest and underrepresented in the West and South and were predominantly female (59.9%). A total of 683,936 hypertensive EMR patients were identified (258.7/1000) as compared with 248.7/1000 (NHIS). Prevalence of hypertension in EMR patients was higher in males than females (286.6/1000 vs. 240.0/1000). Adult diabetic patients were overrepresented in the EMR with 97.8/1000 vs 71.7/1000 (NHIS) and 58.6/1000 (NHANES (FPG > 125 mg/dl)). CONCLUSION: EMR patients are older than the US population and more likely to be female. Prevalence values were similar for hypertension and higher in EMR patients for diabetes. This may reflect the fact that the EMR is used primarily in ambulatory primary care practices. EMR data is generally representative of the US population but differences may exist depending on the disease and population of interest.

A BAYESIAN ADAPTIVE DESIGN FOR EVALUATION OF THE GAP BETWEEN EFFICACY AND ERROR-ADJUSTED EFFECTIVENESS

Moriwaki K1, Kamae I1, Yanagisawa S1, Nagase H3
1Kobe University Graduate School of Medicine, Kobe, Hyogo, Japan, 2Keio University Graduate School of Health Management, Fujisawa, Kanagawa, Japan, 3Kobe University School of Medicine, Kobe, Hyogo, Japan

OBJECTIVES: The gap between “efficacy” in clinical trials and “effectiveness” in real practice due to patient selection, non-compliance and treatment patterns has been broadly recognized among health-care decision makers. However little attention has been paid for statistical errors accompanied in clinical trials, which may cause the gap. The purpose of this study is to develop a new analytical framework to estimate the degree of the gap caused by statistical errors. METHODS: The expected cost-effectiveness ratio (θP) in the real world was formulated in terms of a vector by using a decision analytic approach assuming an evidence-based treatment choice from two treatment options: a new treatment (TA) and a conventional treatment (TB). The value of θP varies depending on the parameters such as cost-effectiveness evidence of TA and TB, type of and type of errors, and a Bayesian prior probability that TA is better than TB. The prior probability is usually estimated by the following two steps: 1) Bayesian inference based on binomial modeling, and 2) Normal approximation of the binomial modeling with the log odds ratio. Then the derived prior probability was applied for our formula to estimate the gap, called “gap formula”, by using a hypothetical dataset. In addition, a Monte Carlo simulation was performed as probabilistic sensitivity analysis. RESULTS: Adaptive estimations of Bayes provided flexible evaluation for the gap formula between real world and clinical trials. The result of the Monte Carlo simulations quantitatively illustrated with distributions how much the θP could be deviated, mainly depending on the type of error, from the ideal average cost-effectiveness ratio. CONCLUSION: The series of methods we developed can be applied in adaptive design for trial-based cost-effectiveness analyses such as sample-size calculation considering the influence of statistical errors.

FORMAL OBJECTIVE BAYESIAN METHODS IN COST-EFFECTIVENESS STUDIES

Armero C1, Garcia-Donato G2, López-Quílez A3
1UNIVERSIDAD DE VALENCIA, Burjassot, Valencia, Spain, 2Universidad de Castilla-La Mancha, Albacete, Albacete, Spain, 3Universidad de Valencia, Burjassot, Valencia, Spain

OBJECTIVES: In probabilistic sensitivity analysis of a cost-effectiveness (CE) study, the unknown parameters, like transition probabilities, are considered random variables. A crucial question is what probabilistic distribution is suitable as synthesizing the available information (mainly data from clinical trials) about these parameters. In this context, it has been recognized the important role of the Bayesian methodology, under which, the parameters are of random nature.

Despite the great appealing of the Bayesian approach to probabilistic sensitivity analysis, the “lack of objectivity” has been frequently argued as the main issue precluding the adoption of Bayesian techniques. This legitimate concern has inspired the development of formal objective priors over the last decades. These priors are obtained as the result of mathematical formal rules applied to the models at hand and lead to Bayesian analyses influenced only by the data at hand. Formal objective priors have a number of appealing properties, including excellent frequentist behaviour.

We explore, in the context of CE analyses, how formal objective Bayesian methods can be implemented. Specifically, we consider two problems that frequently appear in the CE literature: survival analysis and meta-analysis. We describe in detail the numerical methods that needs to be used to obtain the results. The methodology is fully illustrated using two CE analysis published in the literature. We compare our results with those obtained with other approaches to probabilistic sensitivity analysis. We conclude that the differences, when compared with other approaches, can be quite quite marked, specially when the number of patients enrolled in the simulated cohort under study is large.

PROBABILISTIC SENSITIVITY ANALYSES IN HEALTH ECONOMIC MODELING STUDIES: A QUALITY ASSESSMENT

Gsetsios D1, Ishak KJ1, Finnegan S1, Caro JJ2
1United BioSource Corporation, Halifax, NS, Canada, 2United BioSource Corporation, Montreal, QC, Canada

OBJECTIVES: Probabilistic sensitivity analysis (PSA) of economic evaluations has become more important because decision makers want to know how uncertain results are. We evaluated the consistency of PSA methods and how well they adhered to published recommendations. METHODS: Publications of methodological guidelines on the conduct of PSA were reviewed by three researchers, and a consensus set of criteria for assessing PSAs were developed. English language health
economic evaluations based on models, published in 2006 were obtained from a PubMed search using terms “probabilistic sensitivity” or “probabilistic uncertainty”. Methodological items were extracted from each article and independently evaluated against the criteria by each researcher. Disagreements between evaluations were resolved through voting by the entire research team. RESULTS: All 43 economic evaluations identified by the search criteria were reviewed. 86% varied probability and utility inputs but only a minority (25%) did so for cost and resource use inputs. 79% of the studies reported parameter ranges used in the PSA but only half provided rationale for the ranges selected. The majority of analyses (65%) used a single data source to inform distributions, rather than attempt to integrate findings from multiple studies. Parameter correlation was data source to inform distributions, rather than attempt to integrate findings from multiple studies. Parameter correlation was only addressed in one instance and only two studies incorporated structural uncertainty in their analyses. In half of the studies, PSA was the only type of sensitivity analysis conducted, with no one- or multi-way sensitivity analyses. Cost-effectiveness acceptability curves derived from the PSAs were presented in all cases. Less than 10% of studies discussed limitations of their PSA. CONCLUSION: Although PSA has been pushed as standard practice for economic evaluations, the quality of these analyses was mixed. Greater consistency in terms of inclusion of inputs varied and more transparency in describing development of input probability distributions in the conduct of PSAs should improve quality and cross-study comparability of results.

USE OF A DIAGNOSIS-BASED RISK ADJUSTMENT MODEL TO ESTIMATE COSTS OF INDIGENT CARE IN A COMMUNITY AT MEDICAID REIMBURSEMENT RATES
Leslie RC1, Shepherd MD2, Simmons SC2
1University of Texas at Austin, Austin, TX, USA, 2Indigent Care Collaboration, Austin, TX, USA

OBJECTIVES: The Indigent Care Collaboration (ICC) gathers data on hospital and clinic visits for medically indigent patients in the Austin, Texas, area. However, obtaining cost data is challenging within, and especially across, partner providers. A validated cost model would be instrumental in developing programs and initiatives to improve care. The objectives of this study were to estimate the annual costs of Austin, Texas, area medically indigent patients and to describe the prevalence and costs of chronic diseases and conditions using a diagnosis-based risk adjustment model. METHODS: This study used the Diagnostic Cost Groups (DCG) prospective Medicaid All-Encounters model, which uses diagnoses, age, and gender to assign relative risk (RR) scores to patients. The RR scores were multiplied by the per capita Texas Medicaid expenditure to obtain estimated annual costs. Chronic diseases were described in terms of prevalence and total estimated annual cost. RESULTS: A total of 471,194 encounters were recorded for 163,729 patients meeting the study inclusion criteria between March 1, 2004, and February 28, 2005. The mean estimated patient yearly cost was $1,306.81, and the total estimated yearly population cost was $228,909,529. The most common chronic diseases and conditions included hypertension, diabetes, depression, substance abuse, pregnancy, asthma, chronic obstructive pulmonary disease (COPD), and congestive heart failure (CHF). CONCLUSION: This study demonstrates how the unknown costs associated with caring for medically indigent patients in a community can be estimated at Medicaid reimbursement rates using the DCG model on aggregated patient encounter data.

THE OPERATIVE INTERVAL OF AN INCREMENTAL COST-EFFECTIVENESS RATIO: A NEW BENCHMARK FOR ASSESSING THE BOUNDARIES ON THE EFFICIENT FRONTIER CURVE
Kamei J1, Moriwaki K2, Yanagisawa S3, Kamea M4
1Keio University Graduate School of Health Management, Fujisawa, Kanagawa, Japan, 2Kobe University Graduate School of Medicine, Kobe, Hyogo, Japan, 3Tufts-NEMC, USA, Boston, MA, USA

OBJECTIVES: The concept of efficient frontier, given a series of cost-effectiveness estimates for different levels of programs, plays an important role in the incremental analysis. The purpose of the study is to exploit a theoretical aspect of the incremental cost-effectiveness ratios (ICERs) in the context of the efficient frontier curve, and then to identify the upper and lower limits that bound the ICER, considering a potential application of the limits for the pricing rule based on the ICER. METHODS: Let two points be PA(Ea, Ca) and PB(Eb, Cb) for programs A and B, respectively, on the E-C plane representing a set of effectiveness and cost. Theoretical developments were undertaken to find a solution for the question on the boundaries, supposed there exists a concave graph of the efficient frontier curve, C = f(E), directing upward from zero on the E-C plane. Model calculation was performed, for an example, when the curve is a quadratic function estimated as C = pE2 + qE + r (p, q, and r: constants). RESULTS: The interval with the derivatives: f′(Ea), f′(Eb)) on C = f(E), respectively, at the points PA and PB was identified as a solution, called ‘operative interval,’ which describes reasonable lower/upper boundaries of the ICER, considering the configuration of the graph. When the efficient frontier curve is quadratic, the width of the interval was estimated as 2p(EA). Namely, the width is variable, not constant, depending on both p and EA. Furthermore, the new benchmark identified four possible scenarios for making a decision to accept the ICER compared with a threshold of willingness-to-pay. CONCLUSION: The concept of the operative interval of an ICER has been introduced, and it suggested potential usefulness for assessing the acceptability.

THE USE OF DISEASE TRANSMISSION MODELLING IN COST-EFFECTIVENESS ANALYSES: STRENGTHS AND WEAKNESSES
Pitman RJ
Oxford Outcomes Ltd, Oxford, Oxfordshire, UK

OBJECTIVES: To explore the contribution made by disease transmission modelling to cost effectiveness analyses. METHODS: Traditional cost-effectiveness analysis quantifies the costs and effects accumulated by an average individual exposed to a particular intervention, relative to one or more suitable comparators. When reacting to an infectious disease, however, many interventions alter the natural history of an infection or individuals’ behaviour in ways that affect the onward transmission of the pathogen. This, in turn, may influence the number of secondary infections generated by each infectious case. For a cost-effectiveness analysis to account for the averted/additional cases, a population level perspective including disease transmission modelling is required, but this comes at a cost. Transmission models take time to construct and parameterise and are often data hungry. Do the insights these models provide justify the investment in time and expertise they require? RESULTS: This exposition outlines the basic concepts underlying disease transmission modelling, presents a simple model for a directly transmitted disease (such as influenza) and demonstrates the enormous impact population level effects can have on the...