the best use of expensive resources. Continued improvements to this process are ongoing, by incorporating off-label estimates into the original model.

CASE6
PILOT PROJECT: INTEGRATING ADMINISTRATIVE AND FINANCIAL DATABASES TO ESTIMATE PRICE OF HOSPITALIZATIONS

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ORGANIZATION: Agency for Healthcare Research and Quality (funding organization)

PROBLEM OR ISSUE ADDRESSED: Hospital administrative data have been used in “cost-effectiveness”, “cost-benefit”, and “burden-of-illness” studies because they contain large numbers of cases for specific conditions and procedures and because charge information is available. While these data generally contain information on how much the hospital charged the hospital stay, they do not provide information on the cost to provide care and the amount reimbursed for care. In the past, AHRQ developed a set of hospital-level cost-to-charge ratios to estimate the cost of providing care. Currently, AHRQ is piloting a project to create price-to-charge ratios that will be used in conjunction with charge information collected on hospital discharge records to estimate the “price” of inpatient hospital care. In developing price-to-charge ratios, the term “price” reflects the amount that hospitals are paid by insurers and consumers based on payer revenue information for each hospital. This is the amount of revenue that hospitals actually receive, net of any discounts negotiated with insurers. These ratios will be linked to the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID). The HCUP SID files contain the universe of inpatient discharge abstracts (including information on charges) in participating States, translated into a uniform format to facilitate multi-State comparisons and analyses. A separate set of ratios will be developed for HCUP encompassing about 90 percent of all U.S. community hospital discharges. The impetus for this pilot is the President’s and Secretary Leavitt’s initiatives to make health care information more transparent to consumers. While the addition of price information will help consumers make more informed choices about hospitalizations for themselves and their families, this information will also be valuable for researchers by providing alternatives to measuring resource use that are better suited for their studies. GOALS: The short-term goals of this project include: • Explore the feasibility of creating prices for common hospital discharge procedures at a state or a state-wide level for four broad payer groups (National, Medicaid, Private, and self-pay) and groupings of conditions. • Increase understanding of pricing differences among payers. • Release the data publicly after some internal validation. The long term goals of this project include: • Develop price-to-charge ratios for the HCUP SID Partner States in conjunction with hospital-specific revenue information from administrative databases, which currently contain charge information and estimated cost. • Validate estimated prices with data sources such as CMS, MarketScan. • Provide states with information on hospital average prices that can be used to populate a Website where consumers can explore prices for common diagnoses. • Release prices publicly on additional AHRQ databases, including national databases such as the Nationwide Inpatient Sample (NIS) and Kids’ Inpatient Database (KID). OUTCOMES ITEMS USED IN THE DECISION: HCUP data have been used in “cost-effectiveness”, “cost-benefit”, and “burden-of-illness” studies because they contain large numbers of cases for specific conditions and procedures and because charge and estimated cost information is available. The addition of estimates of costs will provide researchers an additional tool to more effectively conduct their studies. IMPLEMENTATION STRATEGY: AHRQ will conduct the project with HCUP Partner States that have access to hospital revenue information by payer, and are willing to share state-level charge and price information broken out by the four broad payer groups and broad diagnostic categories. Initially, AHRQ is utilizing information from the HCUP SID Partner States in conjunction with hospital-specific revenue information to develop prices for hospitalizations. RESULTS: This project is on-going and making substantial progress. Five states with the required financial information have been identified. The analytic methods to validate the data have been determined. The plan to create the price-to-charge ratios for these states is in place. An illustrative example of a specific condition or procedure will be provided during the presentation to demonstrate the differences in resource use as measured by “charges,” “costs,” and “prices.” An explanation of what these concepts are capturing will also be presented. LESSONS LEARNED: To date, the project the lessons learned include: 1. The number of States that collect financial information by major payers for each hospital service is limited. 5 States have been identified that have the detailed information required. As the study moves forward, our objective is to identify 8–10 states with this level of information. 2. While States may collect gross and net revenue information by payer, not all States report revenues completely for inpatient and outpatient services. Methods will be developed to address this issue. 3. Definitions of revenues and the level of detailed data collection vary considerably among States. These differences will be reconciled.

PODIUM SESSION II: RESEARCH ON METHODS – Cost & Clinical Outcomes Methods

EVIDENCE-BASED TIME HORIZON FOR THE INTERVENTIONS IN PHARMACOECONOMIC MODELS

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The measurement of a long-term outcome is necessary, selecting evidence-based time horizons according to pharmacoeconomics data is crucial. OBJECTIVE: To illustrate the effect of assumed time horizon for the interventions in pharmacoeconomic models on measured outcomes. METHODS: The benefit of reducing LDL-C was incorporated into a model to calculate reduction in cardiovascular events and resulted economic outcomes. Data for LDL-C reduction from a head-to-head RCT [Am Heart J 2002;144:1044-51], rosuvastatin (starting 5 mg) versus atorvastatin (starting 10 mg) with up-titration doses were incorporated into the model; and distribution of cardiovascular risk for users (N = 140,000, duration five years) in Canadian population [Clin Invest Med 2007;30:E63-E69] were assumed. To find out the effect of time horizon on economic evaluation of therapeutics, the component of five years was changed to ten years time horizon. RESULTS: Using five years duration of therapy, rosuvastatin and atorvastatin can prevent 9,005 and 8702 cardiovascular events (non-fatal MI and stroke), respectively. Reduction in non-fatal MI and stroke can be translated to $252,300,392 (CDN) and $230,980,624 direct cost savings, respectively ($288,871,921 and $158,510,416 total net-benefit). With ten years assumption for statin therapy, rosuvastatin and atorvastatin can prevent 25,948 and 22,190 cardiovascular events, respectively. The prevention of cardiovascular events according to the model based on ten years horizon were calculated 2.73 and 2.55 times higher than the five years based model for rosuvastatin and atorvastatin, respectively. CONCLUSION: This simulation study illustrates the effect of incorporated time horizons in pharmacoeconomic models on the resulted outcomes. Therefore, considering an evidence-based time horizon for the model is essential. For example, find out the five years Canadian community-based clinical practice data reported a median of approximately five years of statin therapy for the patients. Therefore, a time horizon of five years was assumed to be an evidence-based time horizon for the model.

METHODS FOR INTERPRETING AND DISPLAYING RESULTS FROM REGRESSION MODELS: BEYOND BETAS AND ODDS RATIOS

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OBJECTIVE: To present practical methods for interpreting and displaying results from regression models that mitigate the risk of miscommunication and misinterpretation. METHODS: A series of examples of correct and incorrect ways of presenting results from regression models will be presented from the recently published pharmacoeconomics and outcomes research literature. Methods for computing expected values and predicted probabilities from ordinary least squares (OLS) and logistic regression models will be presented. RESULTS: Computing and presenting expected values and predicted probabilities can, and have in some of the published literature, resulted in less ambiguous and easier to interpret results. CONCLUSION: As pharmacoeconomics and outcomes researches are called on to the present our results not only to our peers, but also to policy-makers and the lay media. Therefore, it is important to make sure results from complicated regression analyses are properly communicated and interpreted. However, coefficients from all but the simplest models are often incorrectly interpreted. Odd ratios from logistic regression models are even more likely to be misinterpreted (as risk ratios). Furthermore, simply reporting odds ratios does not convey information about the probability of outcomes occurring for reference group(s). It will be argued that computing and presenting the expected value, E(Y), from an OLS model and the predicted probability, Pr(Y), from a logistic regression can help researchers better “tell a story” and result in less ambiguous presentations of findings. For example, the adjusted expected costs of an intervention can be computed for different doses and for different demographic groups and the predicted probability of medication adherence can also be computed as a function of different combinations of patient demographic characteristics and attitudes.

ESTIMATING DRUG COSTS IN ECONOMIC EVALUATIONS IN IRELAND AND THE UK: AN ANALYSIS OF PRACTICE AND RESEARCH RECOMMENDATIONS

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OBJECTIVES: The cost of the drug of interest, its comparator(s) and concomitant drugs, are important parameters in pharmacoeconomic evaluations. Although general methods guidelines exist, there are no specific recommendations on drug cost estimation. The aim of this study was to assess current practice in the reporting and conduct of drug costing in Ireland and the UK, and make recommendations for improving future practice. METHODS: We searched the NHS Economic Evaluation Database for evaluations published in Ireland between 2001–2006. Due to the large number of UK studies, we considered only those published between 2005–2006. To assess the generalisability of our findings we included studies from Denmark, Finland and Norway published between 2001–2006. This generated 59 studies. Data were extracted on: name(s) of medicine(s), route of administration, source of drug cost, cost