work-related activities consisting of nurse, pharmacist, and/or patient medication dispensing, preparation, administration and/or storage. Projects consisted of time and cost differences related to 1) three proton pump inhibitor dosage forms and seven administration methods, and 2) seven recombinant human growth hormone administration methods. Performance-based time costs were then used to determine personnel/patient opportunity time and supply costs associated with different forms of medications and delivery devices. Simulations were developed and used to hold independent variables constant so only observed differences between medications and/or administration methods were assessed. Statistical and microeconomic cost analyses were conducted specific to each type of medication and/or device. RESULTS: Processes and results show two detailed examples as case studies of how simulation-based research may be used to assess health care processes at the micro level. The advantages of isolating and understanding factors from the day-to-day complexity of patient care delivery have been demon-

structured. Simulations may also represent an efficient assessment alternative of health care processes at the macro level with potential for projection to the macro level as compared to live, direct observation, cost-intensive, patient-centered care practice evaluations. CONCLUSIONS: Simulation-based time and motion and activity-based cost analyses allowed detailed macro-level time, workload, and supply evaluations that may be projected to the macro level. Professional schools' simulation laboratories offer appropriate settings for such studies.

ESTIMATING TIME-PROFILeD ECOnOMIC BURDEN OF ILLNESS

Thomson Reuters, Cambridge, MA, USA; Thomson Reuters, Washington, DC, USA

OBJECTIVES: Demonstrate a technique to characterize the economic burden of illness over time, correcting for censoring bias and controlling for difference in baseline characteristics between comparison groups. A sample of patients with diagnosis of disease A in 2004–2008 were extracted from MarketScan® databases and followed to death, disenrollment, or December 31, 2008 (cases). The first diagnosis date was the index date. Enrollees without disease A were extracted as controls. Their index dates were assigned based on the distribution of index dates of cases. METHODS: First, Kaplan-Meier estimates for the probability of remaining in the data were calculated by month and disease status. Failure event was death or disenrollment. Censoring event was termination of MarketScan contract or end of study period. Next, total health care costs were estimated using generalized linear models (GLM) on the sub-sample of survivors/enrollees in each month, controlling for disease status, patient demographic and clinical characteristics. Adjusted costs were calculated by month and disease status using the regression estimates and average characteristics. Estimated total costs during the whole follow-up period were the sum of probability of remaining in the data multiplied by regression-adjusted costs in each month. RESULTS: At the end of year 1, 40.5% of cases deceased or disenrolled from uninsured; 13.6% of controls (p < 0.001); at the end of year 4 these figures were 76.4% and 30.5%, respectively (p < 0.001). GLM results indicated significantly higher cost among the group with disease A in each month during follow-up. The adjusted costs based on average characteristics was $86,592 for cases vs. $6,178 for controls in the first year and $151,077 vs. $21,890 in the first 4 years. CONCLUSIONS: In studies with variable-length follow-up, an estimator combining the survivor probability and regression-adjusted cost is more robust to censoring bias, and better depicts the economic burden of illness over time.

CONCEPTUAL PAPERS & RESEARCH ON METHODS – Databases & Management Methods

THE EFFECT OF LENGTH OF OBSERVATION AND CLAIMS DATA TYPE ON ESTIMATES OF COMORBIDITIES AMONG MEDICAID BENEFICIARIES

University of Mississippi, Oxford, MS, USA

OBJECTIVES: Researchers frequently use claims data to create comorbidity measures. The objective of this project was to examine how the number of months of observation data and the type of claims data can affect identification of comorbidities. METHODS: Inpatient (IP) and outpatient (OT) claims data were used to identify comorbidities for beneficiaries enrolled in a state Medicaid program. Beneficiaries were included if they were enrolled 24-month period between January 2002 and December 2004. Data were used to identify the first month in which an ICD-9 code appeared for each of the 17 comorbidities included in the Charlson Comorbidity Index. The D’Hoore scoring system was used to identify ICD-9 codes associated with each comorbid condition. Results from the IP and OT claims were combined to create overall comorbidity measures. RESULTS: The study included a total of 618,337 unique patients. The OT claims could identify almost all comorbidities (low of 88.0% for myocardial infarctions, high of 99.3% for diabetes). IP claims were much less likely to be enrolled. Similarities during the 24-month period had been identified for dementia (43.9%), cerebrovascular disease (45.6%), peripheral vascular disease (45.6%), and myocardial infarction (48.4%). In contrast, 78.1% of patients with diabetes and 69.0% of patients with chronic pulmonary disease events had been identified at 12 months. CONCLUSIONS: The percentage of patients ascribed comorbidities will vary significantly depending on the number of observation months. Obviously, the incidence rate for new events/diagnoses contributes to the increase over time. However, researchers must be careful since some comorbidities may not be associated with frequent enough physician office visits to accurately detect existing comorbidities when the number of observation months is short.

DATA SCAFFOLDING: A PRAGMATIC APPROACH TO STRUCTURING A LITERATURE REVIEW SPREADSHEET TO MAXIMIZE INFORMATION, FACILITATE REVIEW AND SUPPORT ANALYSIS

ICON Clinical Research, Lifecycle Sciences Group, San Francisco, CA, USA; ICON Clinical Research, Lifecycle Sciences Group, Chicago, IL, USA

OBJECTIVES: Clinical literature reviews, especially systematic reviews, require the management and evaluation of large amounts of bibliographic data. Although the methodology for performing reviews is well documented, few sources share practical guidance on how to electronically manage citation data in order to efficiently inven-

tory, organize, and assess published material. Spreadsheet tools (e.g., Excel®) give researchers unparalleled freedom to manipulate a large volume of information culled from source databases (e.g., MEDLINE®); however, many researchers lack a blueprint for structuring their data to facilitate review. METHODS: We describe a process of erecting “data scaffolding” that is critical to transforming a literature review spreadsheet into an agile, manipulable source of information that can triage, sort, and report on materials retrieved for review. RESULTS: Using a sample of literature data pulled from PubMed®, we describe several ideas for adding key structural components to a spreadsheet of citations that bring flexibility and functionality to the processes of literature review and analysis. In doing so, we also describe advantages and why spreadsheet design to facilitate literature review, such as the importance of the spread-

sheet layout; the addition of flag fields to use medical subject headings or key words to easily sort, organize, identify/retrieve, navigate, and summarize citations; and ways of leveraging spreadsheet features such as autofilters, freeze-panes, and sub-

totals that can greatly facilitate the inventory and management of large volumes of citation data to support literature reviews. CONCLUSIONS: In an era of increasing volumes of published literature and the proliferation of rigorous, formalized, system-

atic and non-systematic reviews, researchers must adapt to growing demands. Existing spreadsheet tools can be leveraged to effectively meet these demands, in ways that not only provide for greater efficiency but in ways that may result in enhanced research capabilities.