

# ISPOR Fifteenth Annual International Meeting Research Abstracts

## PODIUM SESSION I: RESEARCH ON DATABASE METHODS

### DEVELOPMENT AND VALIDATION OF A MODEL TO PREDICT VIROLOGIC FAILURE USING ADMINISTRATIVE CLAIMS

Juday T<sup>1</sup>, Jing Y<sup>1</sup>, Chang E<sup>2</sup>, Broder M<sup>2</sup>

<sup>1</sup>Bristol-Myers Squibb, Plainsboro, NJ, USA, <sup>2</sup>Partnership for Health Analytic Research, LLC, Beverly Hills, CA, USA

**OBJECTIVES:** When studying HIV infection, administrative claims databases can provide information on treatment and cost for large numbers of patients but most do not contain laboratory test results, making it impossible to know when a change in antiretroviral treatment (ART) was due to virologic failure. Our objective was to develop and validate a model for identifying patients in a claims database who switched ART due to virologic failure. **METHODS:** We identified three databases of adult HIV-positive patients who switched ART regimens between January 1, 2003 and March 31, 2008. The HIV Insight clinical registry was used to develop a logistic regression model incorporating demographics, regimen characteristics, and other independent variables to estimate the odds of virologic failure. Next, the subset of the Ingenix i3 LabRx health insurance claims database with HIV viral load test results (claims/lab database) was used to validate the model. The model was then used to estimate the proportion of patients with virologic failure in the full Ingenix i3 LabRx claims database (claims database). **RESULTS:** There were 1,691 patients with ART switches in HIV Insight; 1,073 in the claims/lab database, and 3,954 in the claims database. The base model (main effects only) had good discriminatory ability ( $c = 0.875$ ); but poor overall model fit (Hosmer Lemeshow test,  $p < 0.001$ ). Adding three significant two-way interaction terms improved fit ( $p = 0.8692$ ) and discriminatory ability ( $c = 0.885$ ). When the final model was applied to the claims/lab database, it predicted 18.9% of patients would have virologic failure; the actual proportion was 18.6%. **CONCLUSIONS:** We developed and validated a model that could be used in administrative claims to predict the proportion of ART switches due to virologic failure. Health plans may use this model to identify treatments with rising rates of virologic failure and to examine costs related to such failure.

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claims data is that they often lack socio-economic-status (SES) information including race, years of education, marital status and household income. Therefore, claims-based estimates of utilization and cost measures may be biased. Using Medical Expenditures Panel Survey (MEPS), this paper shows that the SES factors may not have significant bearing on the predicted utilization and cost measures. **METHODS:** The 2007 MEPS data were used for this study. In order to make the study sample resemble a typical sample from claims data from a managed care plan, MEPS patients aged between 18 and 65 years enrolled in a managed care plan throughout 2007 were included in the final sample. Overall and pharmacy costs were analyzed using generalized linear modeling (GLM) with gamma distribution and log link while the number of office and outpatient visits were modeled using GLM with Poisson distribution and log link. Each regression was run with and without the four SES variables, and the resulting predicted values were compared. **RESULTS:** The predicted number of office and outpatient visits with SES covariates in the GLM regression equation were 2.81(SD = 1.92) and 0.43(SD = 0.65), and without SES covariates were 2.83(SD = 1.91) and 0.41(SD = 0.61). Similarly, the predicted pharmacy and total health care cost with SES covariates were \$897(SD = \$1,562) and \$3,990(SD = \$4,697), and without SES covariates were \$854(SD = \$1,334) and \$4,101(SD = \$4,633). Thus, predicted utilization and cost measures with or without the SES variables in the corresponding GLM regression were not statistically different. **CONCLUSIONS:** Our results reject the hypothesis that the lack of SES covariates in claims data might result in biased estimates of utilization and cost. Further investigation is warranted to check the robustness of the model specifications for utilization and cost.

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### ACCOUNTING FOR THE RELATIONSHIP BETWEEN PER DIEM COST AND LOS WHEN ESTIMATING HOSPITALIZATION COSTS

Stolar M<sup>1</sup>, Hu MY<sup>2</sup>, Ishak K<sup>3</sup>, Wang Y<sup>2</sup>, Williams GC<sup>2</sup>, Ferguson J<sup>2</sup>, Getisios D<sup>4</sup>, Alvarez P<sup>1</sup>

<sup>1</sup>United BioSource Corporation, Lexington, MA, USA, <sup>2</sup>The Medicines Company, Parsippany, NJ, USA, <sup>3</sup>United BioSource Corporation, Dorval, QC, Canada, <sup>4</sup>United BioSource Corporation, Halifax, NS, Canada

**OBJECTIVES:** Hospitalization costs in trials are often derived using observed lengths of stay (LOS) and fixed per diem costs obtained from supplemental data sources. This approach assumes per diem costs are independent of LOS, which is generally not the case. We sought to develop an approach that accounts for this relationship to obtain more accurate cost estimates. **METHODS:** To examine the association between peri-operative blood pressure control and hospitalization costs for coronary artery bypass graft (CABG), valve surgery or combined surgeries, data from the Massachusetts Acute Hospital Case Mix Database for 2005–2007 were used to derive LOS-specific per diem costs. Regression analyses were carried out to model this relationship, allowing for non-linear functional forms. Costs were log-transformed to account for their skewed distributions. Exploratory analyses were carried out to identify suitable parameterizations and candidate models were compared using goodness-of-fit statistics. Complications occurring during hospitalization were included as predictors of per diem costs with a possible interaction with LOS. For illustrative purposes we present results for patients undergoing CABG. **RESULTS:** The Massachusetts database yielded 10,601 patients undergoing CABG. Mean  $\pm$  SD LOS was  $9.47 \pm 5.86$  days and per diem cost was  $\$6,241 \pm \$3,019$ . Per diem costs varied across different complications and LOS. Per diem costs were highest for patients who died in-hospital and those with multiple complications. Per diem costs were high for short LOS, then declined steadily to LOS of 14 days, and were relatively constant thereafter, showing a linear relationship between log per diem costs and log LOS. This model had considerably better fit compared to one that assumed a single per diem cost (Akaike Information Criterion 7,825 vs. 10,440, respectively). **CONCLUSIONS:** Mean per diem costs depend highly on the LOS of the hospitalization. Accounting for the relationship between per diem cost and LOS yields better estimates of costs and subsequent inferences.

### EVALUATION OF AGREEMENT BETWEEN INTERNET-BASED SELF- AND PROXY-REPORTED HEALTH CARE UTILIZATION AND ADMINISTRATIVE HEALTH CARE CLAIMS

Palmer L<sup>1</sup>, Johnston SS<sup>1</sup>, Rousculp M<sup>2</sup>, Nichol KL<sup>3</sup>, Mahadevia Pj<sup>3</sup>

<sup>1</sup>Thomson Reuters, Washington, DC, USA, <sup>2</sup>MedImmune, Gaithersburg, MD, USA,

<sup>3</sup>University of Minnesota, Minneapolis, MN, USA

**OBJECTIVES:** Mode of survey administration is an important determinant of the validity/accuracy of self-reported, health care utilization (HCRU). While Internet-based surveys are becoming more common, little is known about agreement between administrative claims data and Internet-based survey self- and proxy-reported HCRU. This analysis evaluated the level of agreement of self- and proxy-reported HCRU as recorded through an Internet-based survey as compared to administrative claims-based HCRU data from three large self-insured U.S. employers. **METHODS:** Monthly Internet-based surveys of employees ( $n = 2,298$ ) in the Child and Household Influenza-Illness and Employee Function Study were captured 11/07–5/08. The survey captured data on the presence and number of visits to hospitals, emergency departments, urgent care centers and office visits for employees' care and for household member (HHM) care ( $n = 6,884$ ). Administrative claims from the MarketScan® Databases were assessed during the same time period and evaluated relative to the survey-based HCRU metrics. Only data for individuals with employer-sponsored health care coverage and who could be linked to the claims data using via direct matching was included ( $n = 5,718$ , 62%). The Kappa ( $\kappa$ ) statistic was used to evaluate visit concordance and correlation statistics were used to describe frequency consistency. **RESULTS:** There was moderate to substantial visit presence and frequency agreement between survey-based and claims-based HCRU for all service categories. Percent agreement for presence of a particular service ranged from 99.2% (inpatient stay,  $\kappa = 0.71$ ) to 76.4% (outpatient visits,  $\kappa = 0.52$ ). The correlation in the survey-based and claims-based visit frequency for inpatient, emergency department, urgent care center and outpatient visits was 0.59, 0.66, 0.42 and 0.61 respectively (all  $p < 0.001$ ). Visit presence and frequency agreement was similar for self- and proxy-reported HCRU. **CONCLUSIONS:** Relative to previously published HCRU metrics elicited from paper and telephone survey methods, this study's agreement values suggest that Internet-based surveys are an effective method to collect self- and proxy-reported HCRU.

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## PODIUM SESSION I: HEALTH CARE EXPENDITURES STUDIES

### MUCH ADO ABOUT THE LACK OF SOCIO-ECONOMIC COVARIATES IN ADMINISTRATIVE CLAIMS DATA

Borah B

Mayo Clinic, Rochester, MN, USA

**OBJECTIVES:** Administrative claims data from managed care plans are often used to assess health care utilization and cost. However, a major criticism against the use of

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### COST-EFFECTIVENESS OF 1ST LINE CHEMOTHERAPY REGIMENS IN THE TREATMENT OF NON-SMALL CELL LUNG CANCER AMONG PATIENTS RECEIVING CARE IN THE OUTPATIENT COMMUNITY SETTING

Hoverman JR<sup>1</sup>, Pohl G<sup>2</sup>, Gruschkus SK<sup>3</sup>, Marciniak M<sup>2</sup>, Forsyth M<sup>1</sup>, Peltz G<sup>2</sup>

<sup>1</sup>Texas Oncology, Dallas, TX, USA, <sup>2</sup>Eli Lilly and Company, Indianapolis, IN, USA,

<sup>3</sup>Healthcare Informatics, The Woodlands, TX, USA

**OBJECTIVES:** To evaluate the incremental cost-effectiveness of combination pemetrexed/platinum chemotherapy relative to other common chemotherapy regimens for 1<sup>st</sup> line treatment of non-small cell lung cancer (NSCLC). **METHODS:** NSCLC patients initiating 1<sup>st</sup> line chemotherapy (pemetrexed/platinum (P/P); carboplatin/paclitaxel + bevacizumab (C/P + B); or carboplatin/paclitaxel (C/P)) from July 1, 2006–June

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