INAPPROPRIATE PRESCRIPTION DRUG USE AND REDUCED HEALTH STATUS FOR THE ELDERLY
Fu AZ, Liu GG
University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

OBJECTIVE: Inappropriate prescribing is a major problem for the elderly. This research is to fill a gap in literature exploring the impact of inappropriate medication use on patient health status. METHODS: Based on the 1996 national Medical Expenditure Panel Survey (MEPS), inappropriate prescription drug use were identified using Beers criteria. Ordered probit models were estimated to quantify the impact of inappropriate drug use on patient self-perceived health status. To minimize the impact of endogeneity problem due to dynamic regression, a comprehensive set of prior health condition variables was included to capture the need conditions for medical care. Complex survey sample design was adjusted in modeling. RESULTS: As the modeling coefficient reaches the robustness, it provides strong evidence indicating a significant adverse impact of inappropriate prescription drug use on patient self-perceived health status (p < 0.01). After conducting the simulation, inappropriate drug use was found to increase the elderly with poor and fair health status by 2.1 and 2.2 percentage points respectively, compared to those with appropriate prescription use. Meanwhile, the same effect decreases the elderly with very-good and excellent health status by 1.9 and 2.8 percentage points respectively. CONCLUSIONS: This study obtained strong evidence indicating that inappropriate drug use can yield sizable adverse impact on patient health status in the elderly. The result also helps to validate the Beers criteria as valid proxy indicators of poor prescribing practices leading to deterioration of health status. Therefore, systematic policy actions are warranted to reduce system medical errors in general and inappropriate prescribing in particular.

HEALTH RELATED QUALITY OF LIFE AMONG PRESCRIPTION DRUG USERS IN SWEDEN: AN EPIDEMIOLOGICAL SURVEY
Isacson D, Bingefors K
Uppsala University, Uppsala, Sweden

OBJECTIVE: The aim was to study health related quality of life (HRQoL) among users of prescription drugs in a population. METHODS: Cross-sectional survey, 20–84 years, in the County of Uppland, Sweden. Five thousand four hundred four (68%) answered the questionnaire. SF-36 was used to measure HRQoL. Self-report with a recall period of two weeks was used to estimate use of prescription drugs. Linear regression analysis was employed for the multivariate analyses controlling for age, sex and co-medication. Non-users were used as the comparison group. RESULTS: A total of 9.7% of the population used drugs for hypertension, 9.5% analgesics, 6.6% hypnotics and/or anxiolytics, 4.2% drugs for asthma, 3.6% drugs for cardiac problems, 2.4% drugs for diabetes, 2.4% antidepressants, and 2.2% used drugs for angina. As expected, users of different drugs had very different patterns of decreased HRQoL. In the Physical Function (PF) dimension users of drugs for angina had the lowest score (−14.2) followed by users of analgesics (−12.3) and users of drugs for diabetes (−7.2). Users of analgesics (21.6) and users of drugs for angina (−17.8) had the lowest scores on Role Physical (RP). Users of antidepressants (−19.4), and users of hypnotics and/or anxiolytics (−17.6) scored lowest in the Mental Health (MH) dimension. The lowest Role Emotional (RE) scores were found among users of antidepressants (−31.3), users of hypnotics and/or anxiolytics (−15.3) and users of drugs for angina (−9.3). The lowest Social Function (SF) scores were found among users of antidepressants (−16.1), and users of hypnotics and/or anxiolytics (−14.5). CONCLUSIONS: Users of prescription drugs have a reduced HRQoL, the pattern of decrease as compared to the general population varies by type of disease and drug use.

HEALTH INVOLVEMENT: RELATIONSHIP WITH HEALTH STATUS AND PATIENT SATISFACTION
Kulkarni AS1, Sansgiry SS1, Hayes D1, Rice GK2
1University of Houston, Houston, TX, USA; 2Kelsey Seybold Clinics, Houston, TX, USA

OBJECTIVE: The purpose of this study was to evaluate the relationships between health involvement, health status, and patient satisfaction with health plan. METHODS: A cross sectional study was conducted by administering surveys to patients filling prescription at 10 Kelsey Seybold pharmacies located around Houston. The surveys distributed were proportional to the prescription volume of the pharmacies. Domains of consumer health involvement were measured using an eight-item, previously validated health motivation scale as well as four-items that measured involvement in health and health plans using a 5-point strongly agree—strong disagree scale. Health status was measured using the SF-12 scale and patient satisfaction with health plan was measured using an 8-item, 5-point Likert scale. Demographic data such as age, gender, education, marital status, race, and income were also obtained. Data were coded and analyzed using SAS statistical package at a set priori significance level of 0.05. Descriptive and correlation analysis were conducted. RESULTS: Analyses was carried out on 326 usable surveys. Mean age of respondents was 45.28 ± 13.35 years (range 21–93). Majority of the respondents were female (71%) and enrolled in a health plan (94%). Respondents in this study had high health motivation scores (3.95 ± 0.67). They were highly involved in activities to improve their health (4.02 ± 0.73) and in selecting their health plan (3.86 ± 1.14). Overall respondents
were satisfied with their health coverage (3.78 1.89). Respondents in this study had low physical (PC) (47.23 ± 9.69) and mental (MC) (47.11 ± 11.33) composite scores on the SF-12 scale. There was a significant correlation between involvement in activities to improve health and patient satisfaction scores. CONCLUSIONS: Consumers were highly motivated to improve their health. Health involvement could be used as a predictor of humanistic outcomes in future studies.

**PHP29**

**PREDICTIVE FACTORS OF INPATIENT DRUG COSTS IN A MOTHER-CHILD TEACHING HOSPITAL**

Bussieres J1, Lebel D1, Dumont M2

1Université de Montréal, Montréal, QC, Canada; 2Sainte-Justine, Montréal, QC, Canada

**OBJECTIVE:** To identify predictive factors of inpatient drug costs in a 500-bed mother-child teaching hospital.

**METHODS:** All hospitalisations in 2000/2001 and 2001/2002 were evaluated. Categorical variables included were major category of diagnosis (MCD) (n = 25), severity index (n = 4), risk index (n = 4) and patient care units (n = 41). Continuous variables included were patient weight (kg), level of intensity of resources utilised (LIRU) and total inpatient drug costs/patient-year. Outliers were excluded: inpatient drug costs/patient-year greater than 5000 $CDN, LIRU > 50 and MCD with less than 10 patients per fiscal year. MCD were analysed as serial dichotomical variables. Data were extracted from the admission and the pharmacy software system.

**RESULTS:** Analysis were based on a cohort of 8479 patients in 2000/2001 and 7355 patients in 2001/2002. Cost was divided by patient’s body weight and log-transformed. A stepwise block multiple regression was processed in two blocks: a first block included LIRU, severity index and risk index and a second block added relevant MCD. Cumulative R² were 15.7 and 19.4 for LIRU, 4.7 and 3.3 for severity index and risk index and a second block added a selection of relevant MCD. A third of total inpatient drug costs/patient-year can be explained by level of intensity of resources utilised, some major category of diagnosis, severity index and risk index. CONCLUSIONS: There are limited information published on predictive factors of inpatient drug costs/patient-year in hospitals. Further analyses are required to build a useful and stronger model for planning and benchmarking drugs costs in hospitals.

**PHP30**

**RATES OF CONTINUATION OF NON FORMULARY MEDICATIONS FOR CHRONIC DISEASE SUFFERERS IN MULTI-TIERED PHARMACY BENEFIT PLANS**

Nair KV1, Valuck RJ2, Allen RR3

1University of Colorado Health Sciences Center, Denver, CO, USA; 2Peak Statistical Services, Evengreen, CO, USA

**OBJECTIVE:** Evaluate the impact of 3-tier pharmacy benefit structures on medication switching patterns.

**METHODS:** The study design was a “pre”-“test”/“post”-test quasi-experimental design with comparison groups using chronic disease sufferers from a health plan in the Western US. Individuals with 2 prescriptions for a non formulary medication (n = 1729) were classified by their pharmacy benefit group as: a) 2-tier moving to a 3-tier structure, (“converting” group); b) 2-tier staying in a 2-tier structure; and c) 3-tier staying in a 3-tier structure. The latter two were “comparison” groups. Two time periods were studies: the “pre” period before and the “post” period, after a change in pharmacy benefit structure. Cox regressions, adjusting for age, gender, chronic disease scores and pharmacy plan structure, assessed differences in the continuation rates of non formulary medications across all groups.

**RESULTS:** Over 60% switched to formulary alternatives when faced with increased co-payments, of which 43.3% switched to a brand alternative (p < 0.001). Less than 10% discontinued their medication. Cumulative continuation rate was higher for the converting group: 30.1% (95% CI 27.6%–34.1%) and similar for members in the two-tier comparison group: 26% (95% CI 21.2%–32.6%). Three-tier comparison group members were half as likely to continue their non formulary medications during the post period: 17.1% (95% CI 14.3%–20.4%). CONCLUSIONS: Individuals confronted with increased co-payments due to the implementation of a three-tier plan often switched their medications to formulary alternatives. While this finding supports the general purpose of three-tier structures, of concern is the potential impact on individuals who discontinued their medications due to these changes.

**HEALTHCARE POLICY—Healthcare Expenditure Studies (Including Productivity)**

**PHP31**

**WHAT WE HAVE MISUNDERSTOOD OF THE HIGH RATE OF OUT-OF-POCKET PAYMENTS IN HEALTH CARE SYSTEMS**

Oh E, Imanaka Y, Ishizaki T

Kyoto University, Kyoto, Japan

**OBJECTIVE:** Among OECD countries Korea has the highest rate of out-of-pocket payments (OOP) in the health care system. This has been pointed out and suggested that it should be much lower. This study investi-