injury and to estimate the cost of treating those injuries. Weighted analyses were used to produce estimates that represented the cost of fall-related injuries in the civilian non-institutionalized population in the United States for 1997. Cost estimates were based on actual reimbursements. Costs were estimated for inpatient hospital care, emergency room visits, outpatient hospital services, office-based provider visits, dental care, home healthcare and prescription drugs. **RESULTS:** In 1997, 2.9 million individuals (9.0% of the non-institutionalized elderly population) reported medical conditions related to 3.3 million falls. Fall-related medical care was provided to 2.3 million individuals. Of the reported fall-related injuries, 25.5% were fractures and 3.5% were hip fractures. Total direct medical cost of fall-related care was $5.01 billion. Mean values were $1521 per fall-related injury, $1716 per injured faller, and $2163 per patient receiving fall-related care. The median expense per injured faller was $151 and the maximum expense was $43,566. The most frequently utilized services for fall-related care included office-based visits, prescription drugs, and emergency room visits. Inpatient hospitalizations, while much less utilized, accounted for nearly half of total costs. **CONCLUSIONS:** Fall-related injury is a common event for the community-dwelling elderly and is associated with substantial direct medical costs.

**PHP37**

**UTILIZATION PATTERNS AND RISK FACTORS FOR HIGH COST RECIPIENTS IN MEDICAID POPULATION**

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**OBJECTIVES:** To describe the characteristics and utilization patterns of Medicaid patients with high health care costs, and assess the risk factors associated with those high cost recipients. **METHODS:** High cost recipients were identified as those whose average monthly Medicaid expense was in the upper 90 percentile of the population. A sample of recipients consisting of 23,965 non-nursing home recipients (212,222 high cost recipients, and 11,743 comparison recipients) were identified for this study using retrospective data analysis of Ohio Medicaid claims from January 1, 1999 to December 31, 2000. Adjusted Clinical Groupâ software was used to categorize population-based clinical characteristics for high cost. Logistic regression analysis was conducted to assess the risk factors associated with high cost recipients. **RESULTS:** The average monthly costs were $2679 per high cost recipient and $185 per comparison recipient. Major cost components were hospitalization, prescription drugs, mental health, physician encounters, and outpatient care. For recipients age 64 or younger, the odds ratios of the risk for high cost were: 1.35 (95% CI 1.26–1.46) for male recipients; 6.72 (CI 6.03–7.51) for disabled or blind recipients, 1.8 (CI 1.64–1.97) for urban recipients, 4.64 (CI 2.93–7.79) for recipients who died during the study period, and 1.38 (CI 1.36–1.39) for each additional comorbid condition. For recipients age 65 or older, the odds ratios of the risk for high cost were: 5.89 (95% CI 3.61–10.0) for disabled or blind recipients, 1.96 (CI 1.40–2.78) for recipients who died during the study period, and 1.2 (CI 1.36–1.39) for each additional comorbid condition. **CONCLUSION:** To prevent future health care costs, it is important to focus on those high-risk recipients with chronic diseases and many comorbidities, being disabled/blind eligible, being male in Medicaid, and living in urban areas through appropriate drug utilization review or disease management programs.

**PHP38**

**THREE-YEAR PREDICTIVE MODEL OF MEDICAL COST RISK AND METHODOLOGICAL ISSUES RELATED TO AN EXPANDED PHARMACY CLAIMS RISK INDEX**

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**OBJECTIVES:** To test the performance of an expanded risk index based on pharmacy claims over longer time periods than previous models. To investigate new alternative methods of handling skewed distributions of medical cost data. **METHODS:** An expanded pharmacy claims risk index was compiled from previous literature and clinical review to include 50 chronic diseases. Each disease state was assigned a weighted score based on relative clinical severity. Scores from each disease state were totaled to obtain an overall risk score per member. The score was applied to a continuously eligible adult population (>18 years) of 116,371 members from a million member mid-western Health plan between August 1, 1998 and July 31, 2001. A baseline pharmacy claims risk score was calculated for August 1, 1998 through July 31, 1999 and used in conjunction with age and gender to predict total costs of care (medical costs and pharmacy costs combined) for the next 2 years using a split-sample linear regression model building and validation technique. Various methods for handling non-normal distribution in the medical cost outcome where evaluated including a new 2-part modeling approach. **RESULTS:** The index was highly correlated with third year pharmacy costs (Spearman rho 0.65 p < 0.001) and moderately correlated with medical costs (Spearman rho 0.30 p < 0.001) and all costs of care (Spearman rho 0.45 p < 0.001). Age (categorical) and baseline pharmacy risk index (categorical) were significant predictors of third-year all costs of care. The R2 for the linear 3-year model (0.05) was improved significantly by log transformation of the cost outcome (R2 = 0.26) in both the estimation and validation samples. However a 2-part modeling approach may improve predictive precision. **CONCLUSIONS:** This expanded pharmacy claims risk index is a significant predictor of total costs of care two years from baseline.
Incorporating statistical methods for non-normal distributions may improve pharmacy claims risk indices.

**PHP39**

**DOES POOR HEALTH STATUS LEAD TO LOWER INCOME PRODUCTIVITY?**

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**OBJECTIVES:** There is a large body of literature indicating income effect on health. This research tests an important hypothesis as to how health human capital in turn contributes to income productivity among the US population. **METHODS:** Income production variable is defined as the product of once weekly working hours and wage rate. Health is measured by self-perceived health status in five scales ranging from being poor, fair, good, very good, and excellent. Following an income production function, we consider the endogeneity of health and its unobserved factors using a panel model design. To achieve national representation, the model is estimated using the 1999 Medical Expenditure Panel Survey (MEPS). **RESULTS:** The study sample includes 19,399 Caucasians and 3,261 African-Americans; their weekly income was $657 and $539 respectively. The ordinary least squares (OLS) model finds no impact of health on income was $657 and $539 respectively. The ordinary least squares (OLS) model finds no impact of health on income productivity to be race-specific for African-Americans only. A policy implication is that the African-American population deserves a special attention on income productivity. First, it finds a health effect on income for African-Americans, indicating a gained income of $31 for being excellent, $24 for being fair compared to poor reference. For Caucasians, a strong health effect on income for both African-Americans and Caucasians. However, a fixed-effect (FE) panel income model shows significant association between health and income productivity. **CONCLUSIONS:** This study makes two primary contributions. First, it finds a health effect on income productivity to be race-specific for African-Americans only. A policy implication is that the African-American population deserves a special attention on health improvement when addressing economic policies for poverty reductions. Second, it sheds light on a methodological issue of endogeneity of health in income production, indicating an estimation bias with OLS results as hypothesized.

**PHP40**

**WORK IMPAIRMENT DUE TO CHRONIC DISEASE IN A POPULATION OF WISCONSIN SCHOOLEACHERS**

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**OBJECTIVES:** Reductions in productivity can hinder an organization’s ability to meet its goals. In the teaching profession, these consequences may be especially detrimental. We performed a cross-sectional study to determine the impact of health on quality-of-life and work-related outcomes for Wisconsin schoolteachers. **METHODS:** Wisconsin schoolteachers were surveyed during the 2002 Wisconsin Education Association Teacher’s Convention. The Work Limitations Questionnaire, an instrument that quantifies work impairment across four subscales (Time Management Demands, Physical Demands, Mental-Interpersonal Demands, and Output Demands), was used along with the EQ-5D, a generic measure of health status. **RESULTS:** A total of 273 teachers responded, with 196 (71.8%) reporting one or more chronic disease(s). The presence of chronic disease was associated with a decreased ability to perform routine teaching activities, including answering student questions (p = 0.0002), completing the entire teaching activity (p = 0.0065), teaching an unfamiliar subject (p = 0.0001), monitoring students (p = 0.0061) and grading papers (p < 0.0001). Additionally, self-rated health status on the EQ-5D visual analog scale was significantly lower than healthy individuals (76.8 and 85.9 respectively, p < 0.0001). Musculoskeletal disorders produced the highest level of impairment on the Physical (mean 31.8, SD 30.1) and Mental-Interpersonal (mean 29.4, SD 25.5) scales while digestive diseases produced the highest level of impairment on the Time (mean 30.2, SD 32.5) and Output (mean 26.3, SD 27.2) scales. **CONCLUSION:** Although Wisconsin academic test scores have consistently remained higher than the national average, the consequences of reduced teacher productivity may be lower student test performance. Regardless of past achievement, room exists for improvement and health related work impairment may be a logical area for increased attention.

**PHP41**

**PHARMACY REIMBURSEMENT FOR PHARMACEUTICAL CARE SERVICES IN AMBULATORY CARE SETTINGS AT US SCHOOLS OF PHARMACY**

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**OBJECTIVES:** This study was done to assess: 1) To determine the level of ambulatory-care pharmacists at US Schools of Pharmacy are getting reimbursed for providing pharmaceutical care services (PCS); 2) To determine factors hindering PCS reimbursement; and 3) to determine what disease states pharmacists are providing PCS for and the billing method. **METHODS:** A survey instrument was constructed for this study. The survey was pre-tested by pharmacy faculty for clarity and time required for completion. The survey was sent via email to all 85 US Schools of Pharmacy during the month of July 2002. **RESULTS:** The total response rate was 34 (40%) of 85 schools, represented by 46 respondents. Forty (87%) respondents provide PCS and 17 (37%) are reimbursed for PCS. Seven (15%) respondents reported billing for less...