**COMPARISON OF ECONOMETRIC MODELS FOR ESTIMATING COST DIFFERENCES: OLS, GAMMA, AND QUANTILE REGRESSION**

Baser O1, Dysinger A1, Baser E1, Yuce H2

1STATinMED Research/University of Michigan; Ann Arbor, MI, USA; 2STATinMED Research, Ann Arbor, MI, USA; New York, City College of Technology/CUNY/STATinMED Research, New York, NY, USA

OBJECTIVES: Propensity score matching and standard regression analysis are common ways to control for baseline differences between comparative groups. They control for observable factors. Instrumental variable approach controls not only for observable factors but also unobservable factors. We compared the three methods and showed that using more advanced techniques alters the estimated results in a significant way. METHODS: Using data from U.S. claims databases, the effect of treatment on total health care expenditures among asthma patients was estimated. Reimbursement amounts were dollars paid by the health plan to the provider including patient co-payments and deductibles. Doctors’ prescribing patterns were used as an instrumental variable for treatment choice. Propensity score matching was employed using the nearest neighbor matching algorithm. Generalized linear model was used as an alternative risk adjustment technique. RESULTS: Patients treated with control medication were younger, more likely to live in the northeast and south of the United States and have a higher Charlson comorbidity score, Exlichouser score and chronic disease score relative to patients treated with reliever medication. The difference between one year health care costs for reliever and controller medication was $2,345 by propensity score matching, $2,195 by generalized linear model, and $2,997 by instrumental variable approach. The difference was statistically significant. CONCLUSIONS: After adjusting for patient clinical and demographic characteristics, controller medication was less costly than reliever medication. The choice of risk adjustment was important. The technique that controlled for both observed and unobserved biases (instrumental variable technique) provided a difference of almost 30% higher than the other techniques.