

Methods: This study used the Behavior Risk Factor Surveillance System, a nationally representative health-related telephone survey, to compare cancer screening rates using surveys of 2012, 2014, 2016 and 2018 based on Medicaid expansion status. A difference-in-difference-in-difference (DDD) model was used to compare the trends. Several sample populations were included in this study for different types of cancer screening. All states were analyzed in this study. States expanded Medicaid during the study period were regarded as the treatment group, otherwise, as a control group. Robustness checks were conducted after main analysis. Statistical analysis was conducted in Stata/SE 15.1 (StataCorp LLC, College Station, TX). **Results:** Medicaid expansion slightly improved screening rate by 2%, 0.3% and 2% respectively for breast cancer, cervical cancer and prostate cancer for respondents whose income were below or at 138 % federal poverty line (FPL) in expansion states comparing respondents whose income were over 138 % in non-expansion states. The screening rate for prostate cancer had a marginally significant improvement, increased by 4% comparing respondents with household income below or at 138 % FPL in expansion states with respondents with household income over 400 % FPL in non-expansion states. And these effects have disparities in different racial groups. **Conclusions:** The effect of Medicaid expansion on cancer screening was not significant for most cancer screening in this study and only marginally significant for prostate cancer when comparing respondents with household income below 138 % FPL in expansion states with respondents with household income over 400 % FPL in non-expansion states.

MC3 DISPARITIES IN HEALTH INSURANCE STATUS AMONG YOUNG ADULT CANCER PATIENTS IN STATES WITH AND WITHOUT MEDICAID EXPANSION: ANALYSES OF THE SURVEILLANCE, EPIDEMIOLOGY AND END RESULTS REGISTRIES, 2007 - 2016

McCormick C,¹ Ko NY,² Calip GS³

¹University of Illinois at Chicago, Chicago, IL, USA, ²Boston University, Boston, MA, USA, ³Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA, USA

Objectives: Health insurance coverage is an important determinant of outcomes among cancer patients, particularly for young adults in the U.S. who have the highest rates of being uninsured. Our objective was to measure the impact of the Affordable Care Act provision of Medicaid expansion on uninsured rates among young adult cancer patients. **Methods:** We conducted a retrospective cohort study of adults ages 20-39 years diagnosed with cancer between 2007 and 2016 in the Surveillance, Epidemiology, and End Results Program registries. We collected information on sociodemographics, clinical characteristics, insurance status at diagnosis and Medicaid expansion status. Covariate-adjusted difference-in-differences (DID) analyses were performed to determine changes in rates of uninsured young adult cancer patients over time. **Results:** From an overall cohort of 9,103 young adult cancer patients identified in 18 population-based registries, 7,196 (79%) resided in states with Medicaid expansion occurring by 2014. Expansion states experienced a reduction in the proportion of uninsured young adult cancer patients in 2014–2016 compared to 2007–2009 (11.3% to 9.1%, diff -2.2%), whereas non-expansion states did not (16.2% to 20.3%, diff 4.1%; DID -6.4%, P<0.01). Reductions in uninsured rates were most consistent among patients ages 20–29 years (DID -11.1%, P=0.047) and non-Hispanic white patients (DID -8.7%, P<0.01). No statistically significant reductions in uninsured rates attributable to Medicaid expansion were observed among adults ages 30–39 years (DID -5.0%, P=0.07) and non-Hispanic black (DID -5.2%, P=0.37), Hispanic (DID -4.5%, P=0.66) and non-Hispanic Asian/Pacific Islander patients (DID -7.7%, P=0.32). **Conclusions:** Between 2007 and 2016, rates of uninsured young adult cancer patients in Medicaid expansion states decreased, whereas there was a relative increase in rates of uninsured young adults with cancer in non-expansion states. Future research and policies to expand health coverage for young adults should consider the unequal gains observed across age and racial/ethnic minority groups.

MC4 IMPROVEMENT IN MEDICATION ADHERENCE FOR MEMBERS ENROLLED IN A ZERO DOLLAR COPAY PROGRAM IS SENSITIVE TO SOCIOECONOMIC STATUS: A BLUE CROSS BLUE SHIELD OF LOUISIANA PERSPECTIVE

Nigam S, Liu M, Cong M, Ouyang J, Zhang Y, Williams H, Chaisson J, Louis K, Cantrell D, Mohundro B, Carby M, Ford M, Vicidomina B, Yuan X
Blue Cross Blue Shield of Louisiana, Baton Rouge, LA, USA

Objectives: Blue Cross Blue Shield of Louisiana (Blue Cross)'s Zero Dollar Copay (ZDC) program removes the copay for a large set of medications related to certain chronic diseases. We aimed to evaluate the effects of the ZDC program on medication adherence by drug class and socioeconomic status. **Methods:** We analyzed Blue Cross members aged 18 years and above who were continuously enrolled in a chronic disease management (DM) program (asthma, chronic obstructive pulmonary disease, coronary heart disease, hypertension, diabetes, or chronic kidney disease) from March 2017 to March 2019. The ZDC treatment cohort was comprised of fully-insured members who had Blue Cross pharmacy benefit that included copays. Members without a copay or who were covered by employers contracting for

administrative services only were included in the control group. All study participants were taking ZDC program-related drugs during the study period with at least 1 month of claims following ZDC enrollment. Propensity score weighting was performed to control for several baseline factors, and difference-in-difference (DID) regression models were used to measure program effects. **Results:** Adherence rates in the ZDC cohort increased for most drug classes compared to the control group, and the largest DID's were observed for diuretics (8.4%), anti-diabetics (6.2%), and calcium channel blockers (6.1%). Across all income levels, average medication adherence increased for members in the ZDC group relative to controls. Members in the lowest income bracket (income between \$0 and \$39,000) showed the greatest improvement in medication adherence compared to other income groups, with average rates increasing by 1.2% in the ZDC group and decreasing by 2.4% in the control group. **Conclusions:** The ZDC program increased medication adherence rates relative to controls, an effect that was primarily driven by members with lower socioeconomic status.

Missing Data Studies

MD2 COMPARISON OF COVARIATE BALANCE AMONG PROPENSITY SCORE MATCHING VERSUS PROPENSITY SCORE WEIGHTING AND STRATIFICATION IN OBSERVATIONAL MEDICAL DEVICE RESEARCH

Wei D,¹ Vashisht A,² Cafri G,³ Johnston S,⁴ Wood J⁵

¹Johnson & Johnson, Raleigh, NC, USA, ²Mu Sigma, Bangalore, India, ³Johnson & Johnson, Warsaw, IN, USA, ⁴Johnson & Johnson, Annapolis, MD, USA, ⁵Johnson & Johnson, Newtown, PA, USA

Objective: Propensity score matching (PSM) is a popular statistical technique to mitigate confounding by measured variables in observational studies. The generalizability of PSM results may be threatened by loss of treated observations as a result of matching with a caliper. Propensity score weighting (PSW) and stratification (PSS) are alternative methods to achieving balance while retaining all treated cases. We compare these three techniques in a real-world study that evaluates the safety of a target medical device to similar devices. **Methods:** The Premier Healthcare Database, which comprises hospital billing records from over 970 hospitals in the US, was queried for all patients who had disposable electrodes used in surgery from January 2000 to December 2018. Patients were classified into target device group (treated) or comparison device group (control). Propensity scores were calculated with a logistic regression model that had 13 covariates, including but not limited to: age, gender, teaching status, and Charlson comorbidity score. For each covariate, standardized mean differences (SMD) were calculated before and after implementing PSM, PSW, and PSS. Covariate balance was assessed by the number of covariates with SMD < 0.1. **Results:** There were 298,505 patients in the treated group and 329,664 patients in the control group. Prior to balancing, 9 out of 13 covariates were unbalanced. After 1:1 PSM (caliper = 0.2), 230,707 (77.3%) patients were retained in the treated group and 12 covariates were balanced. PSW resulted in all treated patients retained and all 13 covariates balanced. PSS (strata=10) also had all treated patients retained, but 8 covariates remained unbalanced. **Conclusion:** PSW achieved balance on all covariates while retaining all treated cases, but PSM resulted in a substantial loss of treated cases and PSS led to residual imbalance in some covariates. Further analysis is warranted to compare the estimates of safety outcomes after the implementation of three covariate balance techniques.

MD3 RISK ESTIMATION BY BOOSTED DOUBLY ROBUST METHOD

Yu W,¹ Ridgeway G,² Marder W,³ Finkle W⁴

¹University of California, Los Angeles, Los Angeles, CA, USA, ²University of Pennsylvania, Philadelphia, PA, USA, ³IBM Watson Health, Cambridge, MA, USA, ⁴Consolidated Research, Inc., Los Angeles, CA, USA

Objectives: The choice of a covariate adjustment method may affect risk estimates in observational studies. We developed a method, the boosted doubly robust (BDR), that can effectively handle numerous correlated covariates and reduce bias and variance in the effect estimates. The method may be applied to many outcome analyses including costs. **Methods:** BDR combines the merits of boosted propensity scoring (BPS) and doubly robust (DR) estimation. BDR first uses BPS to match the joint distribution of the pre-treatment covariates. Secondly, BDR uses an outcome model to handle residual confounding. Statistical arguments suggest that BPS reduces the bias in the risk estimates and that DR reduces bias and variance still further. As an example, we examined the established association between diazepam, a long-acting benzodiazepine, and alprazolam, a short-acting benzodiazepine, and risk of injury using BDR and conventional adjustment methods including no adjustment, Poisson regression, propensity scoring using logistic regression (LPS), and high dimensional propensity scoring (HDPS). **Results:** The study included 78,829 and 118,579 patients with a prescription for diazepam or alprazolam respectively in the IBM MarketScan Database. We compared risk of treatment in the 1–15 days following the initial prescription (post-treatment) with the risk in the 1–365 days prior to treatment (pre-treatment) and computed the post- to pre-treatment rate ratio (RR) in each treatment cohort. We computed the ratio of the RRs