Access and Affordability in Low- to Middle-Income Individuals Insured Through Health Insurance Exchange Plans: Analysis of Statewide Data

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INTRODUCTION

Individuals in states that expanded Medicaid eligibility under the Affordable Care Act are Medicaid-eligible if their income is < 138% of the federal poverty level (FPL). Above this threshold, those with incomes up to 400% FPL purchasing individual coverage on Health Insurance Exchanges (HIEs) may receive sliding-scale subsidies to offset premium costs. In addition, those with incomes up to 250% FPL who select benchmark "silver" HIE plans receive sliding-scale subsidies which offset out-of-pocket (OOP) expenses.[1] We compared measures of access and affordability between Medicaid recipients in Ohio (an expansion state) and low/middle-income Ohioans whose incomes qualified them for HIE cost sharing subsidies.

METHODS

We analyzed data from the 2015 Ohio Medicaid Assessment Survey, covering a representative sample of Medicaid and non-Medicaid Ohio adults ($n = 42{,}876$). Data collection occurred approximately 1 year after the implementation of the state's HIE and Medicaid Expansion. We excluded individuals with primary insurance coverage other than through an HIE plan or Medicaid, including Medicaid/Medicare dual-eligible individuals. We included respondents with annual incomes between 90 and 250% of FPL. The Andersen Health Service Utilization Model[2] guided selection of study covariates (Table 1). As outcomes, we selected (a priori) two measures of access and three measures of affordability (Fig. 1).

Using a propensity score and survey-weighted approach, we estimated the population average treatment effect on the treated for the five outcome measures. The propensity scores (probability of HIE enrollment) were estimated using a logistic regression model that included the survey weights (along with the other study covariates). The propensity score model showed a high degree of discrimination (c-statistic = .83). Standardized differences were used to assess covariate balance between the HIE and Medicaid groups before and after propensity score adjustment. For each outcome measure, we used separate logistic regression models weighted by the product of the survey weights and the inverse probability of treatment (IPT) weights,[4] adjusting for the linear propensity score ("doubly robust" approach[5]). Incorporating survey weights in both the propensity score and the final outcome models allows for unbiased, population-level inference of complex survey data.[4] All analyses were conducted in R.

RESULTS

Applying IPT weights to the data creates a synthetic sample of $N = 347$ for the HIE group and $N = 359$ for the Medicaid group. Our study results generalize to a population of $N =$ 75,161 for the HIE group and $N = 74{,}489$ for the Medicaid group (calculated by summing the survey weights of the synthetic samples).

For both measures of access and all three measures of affordability, individuals in the HIE group were significantly ($\alpha = .05$) more likely to experience problems with access and affordability (Fig. 1).

We conducted two sensitivity analyses to address possible bias introduced by (1) the imputation method and (2) residual confounding due to minor covariate imbalance. These analyses generated odds ratios that were significant and within 8% of the original estimates.

DISCUSSION

Cost sharing for Medicaid recipients is nominal, whereas in HIE plans, it varies by the insurance metal level and (for silver plans only) by the consumer's income. Bronze, silver, gold, and platinum plans have actuarial values (the percentage of healthcare costs the plans are designed to pay) of 60%, 70%, 80%, and 90% respectively.[1] Silver plans for individuals with incomes <

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Table 1 Comparison of Baseline Covariates Between the Health Insurance Exchange (HIE) and Medicaid Groups in the Original Sample and After Inverse Probability of Treatment Weighting (Propensity Score Adjustment)

	Original sample				After PS adjustment			
Variable	**HIE, no. (%) N = 347**	**Medicaid, no. (%) N = 2384**	**St. diff***	**p†**	**HIE, no. (%) N = 347**	**Medicaid, no. (%) N = 359**	**St. diff***	**p†**
Predisposing characteristics								
Family composition								
1 adult, no children	123 (35.4)	609 (25.5)	20.7	< 0.01	123 (35.4)	126 (35.1)	0.7	0.97
1 adult, 1+ children	15 (4.3)	354 (14.8)	51.8		15 (4.3)	15 (4.1)	1.3	
2 + adults, no children	148 (42.7)	636 (26.7)	32.3		148 (42.7)	158 (44.0)	2.8	
2 + adults, 1+ children	61 (17.6)	785 (32.9)	40.3		61 (17.6)	60 (16.8)	2.0	
Age								
18–34 years	53 (15.3)	920 (38.6)	20.7	< 0.01	53 (15.3)	53 (14.7)	1.5	0.98
35–44 years	30 (8.6)	424 (17.8)	51.8		30 (8.6)	29 (8.1)	1.8	
45–54 years	86 (24.8)	511 (21.4)	32.3		86 (24.8)	88 (24.6)	0.4	
55–64 years	178 (51.3)	529 (22.2)	40.3		178 (51.3)	189 (52.5)	2.4	
Male	147 (42.4)	905 (38.0)	8.9	0.13	147 (42.4)	157 (43.7)	2.7	0.73
White race	271 (78.1)	1544 (64.8)	32.2	< 0.01	271 (78.1)	277 (77.1)	2.4	0.72
Region of residence (county type)								
Metro	171 (49.3)	1307 (54.8)	11.1	0.26	171 (49.3)	188 (52.4)	6.2	0.83
Suburban	51 (14.7)	328 (13.8)	2.7		51 (14.7)	50 (14.0)	2.0	
Rural, Appalachian	76 (21.9)	443 (18.6)	8		76 (21.9)	76 (21.2)	1.7	
Rural, non-Appalachian	49 (14.1)	306 (12.8)	3.7		49 (14.1)	45 (12.5)	4.8	
Enabling characteristics								
SES score‡, mean (± SD)	3.19 (1.00)	2.52 (0.98)	67.4	< 0.01	3.19 (1.00)	3.35 (1.24)	15.8	0.16
No primary care provider	119 (34.3)	977 (41.0)	14.1	0.02	119 (34.3)	126 (35.1)	1.8	0.81
Need characteristics								
Self-rated health								
Excellent	54 (15.6)	290 (12.2)	9.4	< 0.01	54 (15.6)	69 (19.3)	10.4	0.56
Very good	127 (36.6)	595 (25.0)	24.2		127 (36.6)	130 (36.3)	0.6	
Good	111 (32.0)	782 (32.8)	1.7		111 (32.0)	105 (29.2)	6.1	
Fair or poor	55 (15.9)	717 (30.1)	39.0		55 (15.9)	55 (15.2)	1.8	
No emergency room visits in past year	260 (74.9)	1397 (58.6)	37.7	< 0.01	260 (74.9)	275 (76.6)	3.8	0.57
No overnight hospitalizations	305 (87.9)	1933 (81.1)	20.9	< 0.01	305 (87.9)	321 (89.4)	4.7	0.43
Has cancer history	30 (8.6)	155 (6.5)	7.6	0.17	30 (8.6)	37 (10.2)	5.6	0.58
Has hypertension	123 (35.4)	885 (37.1)	3.5	0.59	123 (35.4)	119 (33.1)	4.9	0.48
Has heart disease§	18 (5.2)	206 (8.6)	15.6	0.04	18 (5.2)	18 (5.0)	0.7	0.91
Has diabetes	44 (12.7)	410 (17.2)	13.6	0.04	44 (12.7)	46 (12.8)	0.3	0.97
Body mass index								
Underweight/normal	114 (32.9)	656 (27.5)	11.4	0.01	114 (32.9)	110 (30.7)	4.7	0.82
Overweight	117 (33.7)	719 (30.2)	7.5		117 (33.7)	124 (34.6)	1.9	
Obese	116 (33.4)	1009 (42.3)	18.9		116 (33.4)	125 (34.7)	2.8	
Health behavior								
Smoking status								
Currently smokes	75 (21.6)	957 (40.1)	45.0	< 0.01	75 (21.6)	72 (20.2)	3.4	0.78
Former smoker	92 (26.5)	425 (17.8)	19.7		92 (26.5)	103 (28.6)	4.7	
Never smoked	180 (51.9)	1002 (42.0)	19.7		180 (51.9)	184 (51.2)	1.4	
Binge drinking in past month								
Yes	51 (14.7)	373 (15.6)	2.7	< 0.01	51 (14.7)	48 (13.6)	3.1	0.60
Drank but no bingeing	122 (35.2)	621 (26.0)	19.1		122 (35.2)	140 (38.7)	7.3	
Did not drink at all	174 (50.1)	1390 (58.3)	16.3		174 (50.1)	171 (47.7)	4.8	

Absolute standardized differences, between the HIE and Medicaid sample proportions

†P values for χ^2 test (categorical variables) and t test (continuous variables), between the HIE and Medicaid sample proportions

‡The SES score variable is a continuous measure of socioeconomic status ranging from 0 to 7 points, adapted from Berzofsky et al.,[3] where the domains of education, income, and employment are assigned point values, and the SES score is the sum of these point values:

- *Education: less than high school (0 points); high school, some college, associate's degree (1 point); Bachelor's degree (2 points); Master's, professional, doctorate degree (3 points)*
- *Income, as a percentage of the federal poverty level: 100% or less (0 points); 101–200% (1 point); 201–400% (2 points); 401% or greater possible range (3 points)*
- *Employment: unemployed past 6 months (0 points); employed past 6 months (1 point)*

§Includes any diagnosis of myocardial infarction, coronary heart disease, or congestive heart failure

250% of FPL have higher actuarial values (between 73 and 94%) due to the cost sharing reductions.[1] In Ohio, only 70% of eligible individuals take advantage of available cost sharing reductions by enrolling in silver plans; 28% enroll in bronze.[6] By forgoing silver plans in favor of seemingly cheaper bronze plans, enrollees in this income group may unknowingly encounter higher OOP costs.

Medicaid-ineligible low- to middle-income individuals may face significant barriers to accessing affordable care. Policymakers should carefully evaluate whether (1) current income-based cost sharing reductions for silver plans

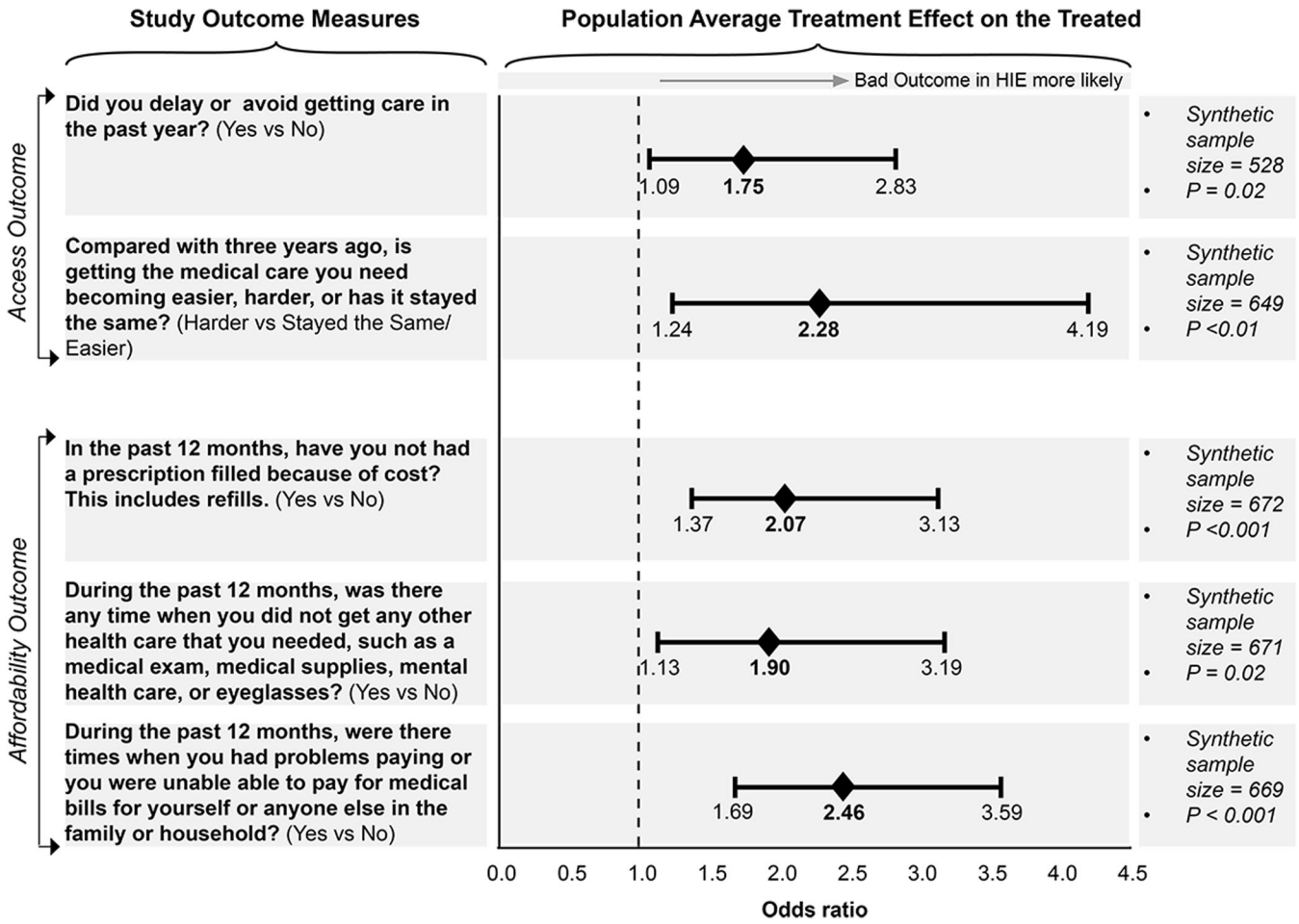

Figure 1 For both measures of the access outcome and all three measures of the affordability outcome, individuals in the HIE group were significantly more likely to experience problems with access and affordability compared to those in the Medicaid group. Individuals in the HIE group are more likely to (1) delay or avoid getting care in the past year, (2) have a harder time getting needed medical care compared with 3 years ago, (3) not fill a prescription due to cost in the past year, (4) not get needed medical exams, medical supplies, mental health care, or eyeglasses in the past year, and (5) have problems paying for medical bills in the past year.

adequately remove barriers to receiving needed care and (2) enrollees adequately understand cost sharing differences across HIE plans.

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Compliance with Ethical Standards:

Conflict of Interest: *Uriel Kim has no conflicts of interest to disclose. Johnie Rose is the co-founder and Chief Medical Officer of VINYA Intelligence, Inc., a healthcare artificial intelligence firm developing remote patient monitoring solutions. None of the firm's work relates directly to the content of the manuscript. Siran Koroukian has no conflicts of interest to disclose.*

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