The Oregon Health Insurance Experiment: Evidence from the First Year

08/27/2021

Broader Question

Is the demand for health care and services downward sloping? How does access to health insurance affect health stock and health care usage?

Some previous concerns

- Numerous studies have inspected the relationship
- Findings are hampered by unobserved differences between insured and uninsured *Are insured and uninsured groups randomly selected? What are some systematic differences between these two groups?*

Bias

$$Y_i = \beta_0 + \beta_1 Insured_i + u_i$$

- Y_i is health care usage
- β_1 tracks the relationship between being insured and health care usage
- Does β_1 show the causal relationship between insurance coverage and health care usage?
  - Why or why not?

Random Assignment

- Health insurance coverage (in reality) is not randomly assigned
- There are systematic factors that leads to being insured
  - education
  - race
  - risk aversion
- These factors can also define health care usage
- One can control for observed factors
- **There are still unobserved factors in the error term that are related to:** *i*) **status of insured vs. uninsured;** *ii*) **health care usage.**

This study

- Examines the effect of Oregon Medicaid lottery after approximately one year of insurance coverage.

- variables of interest
  - health care utilization (cost side)
  - self-reported health, financial strain, over all well-being (benefit side)
  - Note that the study evaluates the effect of Medicaid in a year of window. Too short..

Oregon's Medicaid Lottery

- Medicaid service through two plans
  1) OHP Standard
  2) OHP Plus
- OHP Plus serves categorically eligible population
  - children and pregnant women
  - disabled
  - families in Temporary Assistance to Needy Families (TANF)
- OHP standard: low income adults (19-64) not eligible for OHP Plus
  - Oregon residents
  - U.S. citizens or legal immigrants
  - no health insurance for past 6 months
  - income below the federal poverty level (FPL)
  - assents below $2,000.

The Lottery

- In 2002, about 110,000 were enrolled in OHP Standard
- Enrollment stopped in 2004 due to budgetary cuts
- Only 19,000 left in 2008; state decided that it had budget to enroll additional 10,000
- But the applicants would be way more than 10,000
  - Lottery pick
  - Out of 89,824 individuals, 35,169 individuals (29,664 households) were placed in the treatment group by lottery
- Only about 30% of individuals selected successfully enrolled

Data

Administrative Data

- Hospital discharge data
  - hospital identifier; date of admission; source of admission
- Credit records data from TransUnion's Consumer Credit Database
  - financial well-being
- Mortality Outcomes from Oregon's Center of Health Statistics

Survey Data

- Mail survey to individuals selected by the lottery and roughly the same number of non-selected individuals
- Effective reponse rate of 50%
- Issue of non-reponse

Summary Statistics (Control Group)

TABLE I

DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION (CONTROL GROUP)

Variable	Control mean	Variable	Control mean
Panel A: Full sample			
Sex		Language	
% Female	0.557	% English preferred	0.922
Age		ZIP code–level variables	
% 50–64	0.267	% MSA	0.773
% 20–50	0.733	ZIP code median household income	$39,265
Panel B: Survey responders only			
Lottery list variables			
Sex		Language	
% Female	0.591	% English preferred	0.917
Age		ZIP code–level variables	
% 50–64	0.316	% MSA	0.751
% 20–50	0.684	ZIP code median household income	$39,225
12-month mail survey variables			
Race		Health status	
% White	0.820	Ever diagnosed with:	
% Black	0.038	Diabetes	0.175
		Asthma	0.276
		High blood pressure	0.399
Ethnicity		Emphysema or chronic bronchitis	0.129
% Spanish/Hispanic/Latino	0.123	Depression (screen positive)	0.557

(continued)

Figure 1: Summary Statistics

Summary Statistics (Control Group)

TABLE I

(CONTINUED)

Variable	Control mean	Variable	Control mean
Education		Income (% federal poverty line)	
% Less than high school	0.177	<50%	0.406
% High school disploma or GED	0.491	50–75%	0.138
% Vocational training or 2-year degree	0.220	75–100%	0.140
% 4-year college degree or more	0.112	100–150%	0.177
		Above 150%	0.139
Employment			
% don't currently work	0.551	Insurance coverage	
% work <20 hours per week	0.090	Any insurance?	0.325
% work 20–29 hours per week	0.099	OHP/Medicaid	0.117
% work 30+ hrs per week	0.259	Private insurance	0.128
		Other	0.102
Average household income (2008) $	13,035	# of months of last six with insurance	1.738

Notes. All statistics are reported for control individuals only. Panel A reports the control means for prerandomization demographics taken from the lottery list (from January and February 2008) for the whole sample (N =45,088 for controls). Age refers to age at the end of the study period. "English as preferred language" indicates whether the individual did not check a box requesting materials in a language other than English. Panel B reports control means of lottery list prerandomization demographics and survey questions for survey responders (N =11,933 for controls), weighted using survey weights. "Household income" is gross household income (in $) for 2008 (before taxes and deductions but including any cash assistance or unemployment assistance received); it is reported in bins and we assign individuals the income at the midpoint of their bin (see Online Appendix Figure A4 for details). For the insurance questions, we code as "yes" if the respondent checked that insurance type box; because the survey allows one to check multiple boxes for types of insurance, the subgroups (OHP/Mediciad, private, and other) won't necessarily add up to "any." Private insurance includes employer and privately paid insurance; "Other" insurance includes "Medicare and other." We treat responses for insurance as missing if the responder checked "I don't know" or left all checkboxes blank. We construct income relative to the federal poverty line based on self-reported income and self-reported (total) number of household members. See Online Appendix 3 for more details.

Figure 2: Summary Statistics

Empirical Framework – 1. Intent to Treat Effects

$$y_{ihj} = \beta_0 + \beta_1 Lottery_h + \beta_2 X_{ih} + \beta_3 V_{ih} + \epsilon_{ihj} \ ...(i)$$

- i is an individual; h is a household; j outcomes of interest (e.g., y_{ihj} can be self reported health)
- *Lottery* is an indicator whether household h was selected by the lottery
- β_1 is the coefficient of interest
- X vector of covariates that are correlated with the treatment probability
  - need to be controlled for to attain unbiased estimates of β_1
  - household size (all individuals for a selected member in a household were selected)
- V vector of covariates that are unrrelated to the lottery but included to improve precision
  - demographic variables
  - prerandomization outcomes of credit reports and hospital discharge data

Empirical Framework – 2. Local Average Treatment Effect

$$y_{ihj} = \pi_0 + \pi_1 \hat{Insurance}_{ih} + \pi_2 X_{ih} + \pi_3 V_{ih} + v_{ihj} \ ...(ii)$$

- now use Lottery as an instrument for $Insurance_{ih}$

$$Insurance_{ih} = \delta_0 + \delta_1 Lottery_h + \delta_2 X_{ih} + \delta_3 V_{ih} + u_{ihj} \ ...(iii)$$

- $Insurance_{ih}$ is defined as ever on Medicaid
- where $Lottery_h$ is the excluded instrument.
- the effects of lottery (treatment vs. control) is working through insurance status

Hospital Utilization

- Extensive margin:
  - went to see a doctor or not
- Intensive margin:
  - details about the visit, conditional upon a person visiting the doctor
  - medical expenses
  - days inpatient stay

Hospital Utilization

TABLE IV
HOSPITAL UTILIZATION

	Control mean (1)	ITT (2)	LATE (3)	p-values (4)
Panel A: Extensive margin				
All hospital admissions	0.067	0.0054	0.021	[0.004]
	(0.250)	(0.0019)	(0.0074)	
Admissions through ER	0.048	0.0018	0.0070	[0.265]
	(0.214)	(0.0016)	(0.0062)	
Admissions not through ER	0.029	0.0041	0.016	[0.002]
	(0.167)	(0.0013)	(0.0051)	
Panel B: All hospital admissions				
Days	0.498	0.026	0.101	[0.329]
	(3.795)	(0.027)	(0.104)	{0.328}
List charges	2,613	258	1,009	[0.077]
	(19,942)	(146)	(569)	{0.106}
Procedures	0.155	0.018	0.070	[0.031]
	(1.08)	(0.0083)	(0.032)	{0.059}
Standardized treatment effect		0.012	0.047	[0.073]
		(0.0067)	(0.026)	
Panel C: Admissions through ER				
Days	0.299	0.023	0.089	[0.183]
	(2.326)	(0.017)	(0.067)	{0.187}
List charges	1,502	163	636	[0.091]
	(12,749)	(96)	(376)	{0.171}
Procedures	0.081	0.0080	0.031	[0.135]
	(0.694)	(0.0054)	(0.021)	{0.187}
Standardized treatment effect		0.011	0.044	[0.100]
		(0.0069)	(0.027)	
Panel D: Admissions not through ER				
Days	0.199	0.0033	0.013	[0.841]
	(2.38)	(0.017)	(0.065)	{0.842}
List charges	1,110	98	384	[0.281]
	(12,422)	(91)	(356)	{0.383}
Procedures	0.075	0.010	0.038	[0.080]
	(0.708)	(0.0056)	(0.022)	{0.162}
Standardized treatment effect		0.0077	0.030	[0.254]
		(0.0068)	(0.026)	

Notes. Standard errors in parentheses; per comparison p-values in square brackets; family-wise p-values in curly brackets. Table investigates non–childbirth-related hospitalizations during the time period from notification date to August 31, 2009. All outcomes are measured unconditionally (i.e., are not conditional on admission). Column (2) reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column (3) reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV; for the IV estimates in column (3), the endogenous variable INSURANCE is defined as "ever on Medicaid" during our study period and the first stage is given in the first row of Table III. Column (4) reports the per comparison p-value and (where applicable) the family-wise p-value across the three different measures of utilization used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effect, lottery draw fixed effects, and the analogous outcome measure for the time period from January 1, 2008, through the notification date. All standard errors are clustered on the household. Sample consists of entire sample universe (N =74,922).

Figure 3: Hospital Utilization

Hospital Utilization

TABLE V

HEALTH CARE UTILIZATION (SURVEY DATA)

	Extensive margin (any)				Total utilization (number)			
	Control mean (1)	ITT (2)	LATE (3)	p-values (4)	Control mean (5)	ITT (6)	LATE (7)	p-values (8)
Prescription drugs currently	0.637	0.025	0.088	[0.002]	2.318	0.100	0.347	[0.049]
	(0.481)	(0.0083)	(0.029)	{0.005}	(2.878)	(0.051)	(0.176)	{0.137}
Outpatient visits last six months	0.574	0.062	0.212	[<0.0001]	1.914	0.314	1.083	[<0.0001]
	(0.494)	(0.0074)	(0.025)	{<0.0001}	(3.087)	(0.054)	(0.182)	{<0.0001}
ER visits last six months	0.261	0.0065	0.022	[0.335]	0.47	0.0074	0.026	[0.645]
	(0.439)	(0.0067)	(0.023)	{0.547}	(1.037)	(0.016)	(0.056)	{0.643}
Inpatient hospital admissions last six months	0.072	0.0022	0.0077	[0.572]	0.097	0.0062	0.021	[0.311]
	(0.259)	(0.0040)	(0.014)	{0.570}	(0.4)	(0.0062)	(0.021)	{0.510}
Standardized treatment effect		0.050	0.173	[<0.0001]		0.040	0.137	[0.0003]
		(0.011)	(0.036)			(0.011)	(0.038)	
Annual spending[a]					3,156	226	778	[0.037]
						(108)	(371)	

Notes. Standard errors in parentheses; per comparison p-values in square brackets; family-wise p-values in curly brackets. Hospital admissions exclude childbirth. Columns (2) and (6) report the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Columns (3) and (7) report the coefficient and standard error on INSURANCE from estimating equation (3) by IV; for the IV estimates in column (3), the endogenous variable INSURANCE is defined as "ever on Medicaid" during our study period and the first stage is given in the first row of Table III. Columns (4) and (8) report the per-comparison p-value and the family-wise p-value across the four different measures of utilization used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effects, survey wave fixed effects, and the interaction between the two. All standard errors are clustered on the household and all regressions are weighted using survey weights. Sample consists of survey responders (N =23,741).

[a]To calculate the implied spending effects associated with the estimated utilization effects, we use data from the 2002–2007 (pooled) Medical Expenditure Panel Survey (MEPS) on expenditures of all nonelderly (age 19–64) adults below 100% of poverty who are publicly insured. This gives us a total sample of over 7,500 individuals. We use their expenditures (all inflated with the CPI-U to 2007 dollars) to calculate average expenditures per outpatient visit, average expenditures per ER visit, average expenditures per inpatient visit (for visits not related to childbirth), and average semi-annual (six-month) spending on prescription drug. All spending is total expenditures (i.e., not just insured) expenditures. The underlying costs are $150 per outpatient visit, $435 per ER visit, $7,523 per inpatient visit, and $156 six-month expenditure per current prescription drug; we multiply these all by two to get annual costs.

Figure 4: Hospital Utilization