THE OREGON HEALTH INSURANCE EXPERIMENT: EVIDENCE FROM THE FIRST YEAR

Finkelstein, et al 2012

Questions:

- How does access to health insurance affect health?
- How does it affect health care usage?
- How does it affect financial strain?
- How does it affect overall well-being?

What is the evaluation problem?

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- People with health insurance may differ in other ways from people who don’t have health insurance
- People with health insurance may be richer, which might lead us to expect they would be healthier even in the absence of insurance
- Holding wealth constant, they might be healthier, have less need for insurance

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- Holding wealth constant, they might be healthier, have less need for insurance
- More formally, $E(Y_0 \mid D=1) \neq E(Y_0 \mid D=0)$

Implication

- Comparing people with and without health insurance unlikely to isolate effect of health insurance on health

How to solve evaluation problem?

- Run an experiment
- Determine relevant population
- Randomize to treatment and control
- Give treatments (but not controls) opportunity to enroll in health insurance

Few previous large-scale insurance experiments

- RAND Health Insurance experiment (US, 1970s)
- Seguro Popular (Mexico, mid-2000s)

Why did the Oregon experiment come about?

- State had funding to insure 10,000 new Medicaid-eligible (=poor and uninsured) adults in Medicaid expansion program (OHP Standard)
- Roughly 90,000 people were eligible
- Given resource constraints, random assignment is a fair way to allocate access
- Also useful for research

Medicaid (OHP) in Oregon

- Two programs
  - OHP Plus
  - OHP Standard (expansion program)
- OHP Plus covers categorically eligible individuals
  - Poor children and pregnant women
  - Disabled
  - Welfare recipients
- OHP Standard covers
  - Oregon residents 19-64 years old who are US citizens
  - Income below FPL, assets below $2000
  - Not otherwise eligible for Medicaid

OHP

- Coverage
  - Doctor visits
  - Hosplitalization
  - Prescriptions
  - Mental health services
- Administered via managed care organizations
- Premiums: $0-20/month
- No co-pays
- Not all docs accept Medicaid patients

The lottery

- Sign-ups during February 2008
- No initial eligibility screening
- Eight lotteries between March and September 2008
- 35,169 people selected by lottery
- Had to fill out additional application materials within 45 days, meet eligibility conditions in order to get Medicaid card
- If applicant got Medicaid card, so did everyone else in his/her household, so HH's with multiple applicants had higher chance of winning

The winners

- Only 60% sent back applications
- Half of them were ineligible
- Bottom line: roughly 30% of lottery winners were actually enrolled in Medicaid

Evaluating the effect of the program

- Question: Does random assignment identify the effect of access to health care?

Validity issues

- External validity
- Internal validity

Digression on data

- Sources
  - Administrative Medicaid records from state, to measure Medicaid and OHP coverage
  - Credit reports, for measuring financial strain, obtained for part of sample
  - Surveys, administered to subset of sample
- Different outcomes correspond to different samples

External validity issues

- Randomization bias
- Equilibrium effects

Randomization bias

- Lottery was executed statewide
- No question of some local offices being more functional, better managed than others
- Is Oregon better at delivering Medicaid than other states?

Equilibrium effects

- If enough people move to Medicaid expansion program, could affect private insurance offerings in the state
- Seems unlikely, since private insurance is not widely held by target population
- Can look for evidence in form of crowd-out; still may not be informative if program were fully scaled up

Internal validity

- Control substitution
- Program dropout

Control substitution

- Question is, how many controls received similar coverage?
- Answer depends on how we define similar

TABLE III

First-Stage Estimates

		Full sample		Credit report subsample		Survey respondents	
		Control mean (1)	Estimated FS (2)	Control mean (3)	Estimated FS (4)	Control mean (5)	Estimated FS (6)
(1)	Ever on Medicaid	0.141	0.256	0.135	0.255	0.135	0.290
			(0.0035)		(0.0042)		(0.0066)
(2)	Ever on OHP Standard	0.027	0.264	0.028	0.264	0.026	0.302
			(0.0029)		(0.0036)		(0.0055)
(3)	# of months on Medicaid	1.408	3.355	1.352	3.366	1.509	3.943
			(0.045)		(0.055)		(0.090)
(4)	On Medicaid, end of study period	0.106	0.148	0.101	0.151	0.105	0.189
			(0.0031)		(0.0038)		(0.0061)
(5)	Currently have any insurance (self-report)					0.325	0.179
							(0.0077)
(6)	Currenty have private insurance (self-report)					0.128	−0.0076
							(0.0053)
(7)	Currently on Medicaid (self-report)					0.117	0.197
							(0.0063)
(8)	Currently on Medicaid					0.105	0.191
							(0.0060)

Program dropout

- As we have seen, lots of apparently eligible winners chose not to fill out paperwork to obtain Medicaid coverage
- With no program dropout, first-stage regression of coverage on random assignment dummy would show 100% coverage in the treatment group
- Instead, it shows that about 40% were ever on any type of Medicaid, and about 30% ever had Medicaid expansion coverage (OHP standard)

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Conclusion

- Difference in outcomes between treatments, controls does not identify effect of insurance coverage

What are our options?

What are our options?

- Intent-to-treat
- LATE

ITT

- Estimated from reduced-form regression

$$(1) \qquad y_{ihj} = \beta_0 + \beta_1 LOTTERY_h + X_{ih}\beta_2 + V_{ih}\beta_3 + \varepsilon_{ihj},$$

(Z_h)

- Regression of outcome on Z, with controls for HH applicants (X), pre-treatment outcomes (V)
- Rationale for including those variables?
- Interpretation?

LATE

- Divide coefficient on LOTTERY from reduced form regression by coefficient on LOTTERY in first-stage regression:

$$(4) \quad INSURANCE_{ih} + \delta_0 + \delta_1 LOTTERY_h + X_{ih}\delta_2 + V_{ih}\delta_3 + \mu_{ihj},$$

- Equivalently, estimate via 2SLS regression

$$(3) \qquad y_{ihj} = \pi_0 + \pi_1 INSURANCE_{ih} + X_{ih}\pi_2 + V_{ih}\pi_3 + v_{ihj},$$

- Using LOTTERY as an instrument for INSURANCE
- Interpretation?

Last step before looking at results

- Check balance between treatments and controls
- Indicates whether random assignment was done correctly

TABLE II

TREATMENT: CONTROL BALANCE

	Control mean (std. dev.) for full sample	Difference between treatment and control		
		Full sample	Credit report subsample	Survey respondents subsample
	(1)	(2)	(3)	(4)
Panel A: Match/response rates				
Matched in September 2009 credit data	0.663		−0.0043	
	(0.473)		(0.0037)	
			[0.247]	
Responded to survey	0.506			−0.016
	(0.500)			(0.0066)
				[0.014]
Response time (in days)	53.0			1.638
	(57.8)			(1.088)
				[0.132]
Panel B: Prerandomization characteristics				
Lottery list variables				
F-statistic		1.286	0.553	0.574
[*p*-value]		[0.239]	[0.836]	[0.820]
Pre-randomization outcomes				
F-statistic		0.543	0.921	1.266
[*p*-value]		[0.844]	[0.518]	[0.281]
Both of the above				
F-statistic		0.915	0.793	0.782
[*p*-value]		[0.56]	[0.726]	[0.680]
N		74,922	49,980	23,741

Notes. Standard errors in parentheses; per comparison *p*-values in square brackets. In Panel A, we analyze match and response rates. The first column reports the mean and standard deviation for the control sample of the outcome shown in the left column. Columns (3) and (4) report estimated differences between treatments and controls for the dependent variable shown in the left column and the sample indicated in the column heading. Specifically they report the coefficient on *LOTTERY* based on estimating equation (1). All regressions include household fixed effects and cluster on household. In addition, in column (4) we include survey wave fixed effects and the interaction of survey wave fixed effects and household fixed effects and use survey weights. The full sample (i.e., the sample used in the hospital discharge and mortality data) is used in column (3). and the entire survey sample is used in column (4). In *Panel B* we report the *F*-statistic and *p*-value from regressing multiple prerandomization characteristics on *LOTTERY* in equation (1). "Lottery list variables" are common across all three samples and consist of nine demographic variables derived from information provided at the time of lottery sign up: year of birth; sex; whether English is the preferred language for receiving materials; whether the individual signed him- or herself up for the lottery or were signed up by a household member; whether the individual gave his or her address as a PO box; whether he or she signed up the first day the lottery list was open; the median household income in the 2000 census from their ZIP code; whether the ZIP code given is within a census-defined MSA; and whether he or she provided a phone number on sign up. "Prerandomization outcomes" are specific to the sample (we look at the hospital outcomes that we subsequently analyze for column (2), the credit report outcomes we subsequently analyze for column (3), and a few measures from each that approximate survey questions we subsequently analyze for column (4)). More detail on the prerandomization outcomes, the exact regression specifications, and the results for each variable analyzed in Panel B are presented in Online Appendix 3, Table A13.

Results

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)	

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)	

TABLE VI

Compliance with Recommended Preventive Care (Survey Data)

	Control mean (1)	ITT (2)	LATE (3)	p-values (4)
Blood cholesterol checked (ever)	0.625	0.033	0.114	[<0.0001]
	(0.484)	(0.0074)	(0.026)	{<0.0001}
Blood tested for high blood sugar/diabetes (ever)	0.604	0.026	0.090	[0.0004]
	(0.489)	(0.0074)	(0.026)	{<0.0001}
Mammogram within last 12 months (women $\geq$ 40)	0.298	0.055	0.187	[<0.0001]
	(0.457)	(0.012)	(0.04)	{<0.0001}
Pap test within last 12 months (women)	0.406	0.051	0.183	[<0.0001]
	(0.491)	(0.01)	(0.034)	{<0.0001}
Standardized treatment effect		0.087	0.300	[<0.0001]
		(0.012)	(0.041)	

TABLE VII

Financial Strain (Administrative Data)

	Control mean (1)	ITT (2)	LATE (3)	*p*-values (4)
Panel A: Overall				
Any bankruptcy	0.014	0.0022	0.0086	[0.106]
	(0.119)	(0.0014)	(0.0053)	{0.358}
Any lien	0.021	0.0012	0.0047	[0.406]
	(0.144)	(0.0014)	(0.0056)	{0.698}
Any judgment	0.064	0.0014	0.0054	[0.573]
	(0.244)	(0.0024)	(0.010)	{0.698}
Any collection	0.500	−0.012	−0.048	[0.003]
	(0.500)	(0.0041)	(0.016)	{0.013}
Any delinquency (credit accounts)	0.366	0.0016	0.0063	[0.704]
	(0.482)	(0.0042)	(0.017)	{0.698}
Standardized treatment effect		0.0022	0.0086	[0.653]
		(0.0049)	(0.019)	
Panel B: Medical debt				
Any medical collection	0.281	−0.016	−0.064	[<0.0001]
	(0.449)	(0.0040)	(0.016)	{<0.0001}
Amount owed in medical collections	1,999	−99	−390	[0.028]
	(6733)	(45)	(177)	{0.025}
Standardized treatment effect		−0.026	−0.100	[<0.0001]
		(0.0061)	(0.024)	
Panel C: Nonmedical debt				
Any nonmedical collection	0.392	−0.0046	−0.018	[0.264]
	(0.488)	(0.0041)	(0.016)	{0.455}
Amount owed in nonmedical collections	2,740	−20	−79	[0.751]
	(9,492)	(63)	(248)	{0.752}
Standardized treatment effect		−0.0058	−0.023	[0.325]
		(0.0059)	(0.023)	

TABLE VIII

FINANCIAL STRAIN (SURVEY DATA)

	Control mean (1)	ITT (2)	LATE (3)	*p*-values (4)
Any out of pocket medical expenses, last six months	0.555 (0.497)	−0.058 (0.0077)	−0.200 (0.026)	[<0.0001] {<0.0001}
Owe money for medical expenses currently	0.597 (0.491)	−0.052 (0.0076)	−0.180 (0.026)	[<0.0001] {<0.0001}
Borrowed money or skipped other bills to pay medical bills, last six months	0.364 (0.481)	−0.045 (0.0073)	−0.154 (0.025)	[<0.0001] {<0.0001}
Refused treatment because of medical debt, last six months	0.081 (0.273)	−0.011 (0.0041)	−0.036 (0.014)	[0.01] {0.01}
Standardized treatment effect		−0.089 (0.010)	−0.305 (0.035)	[<0.0001]

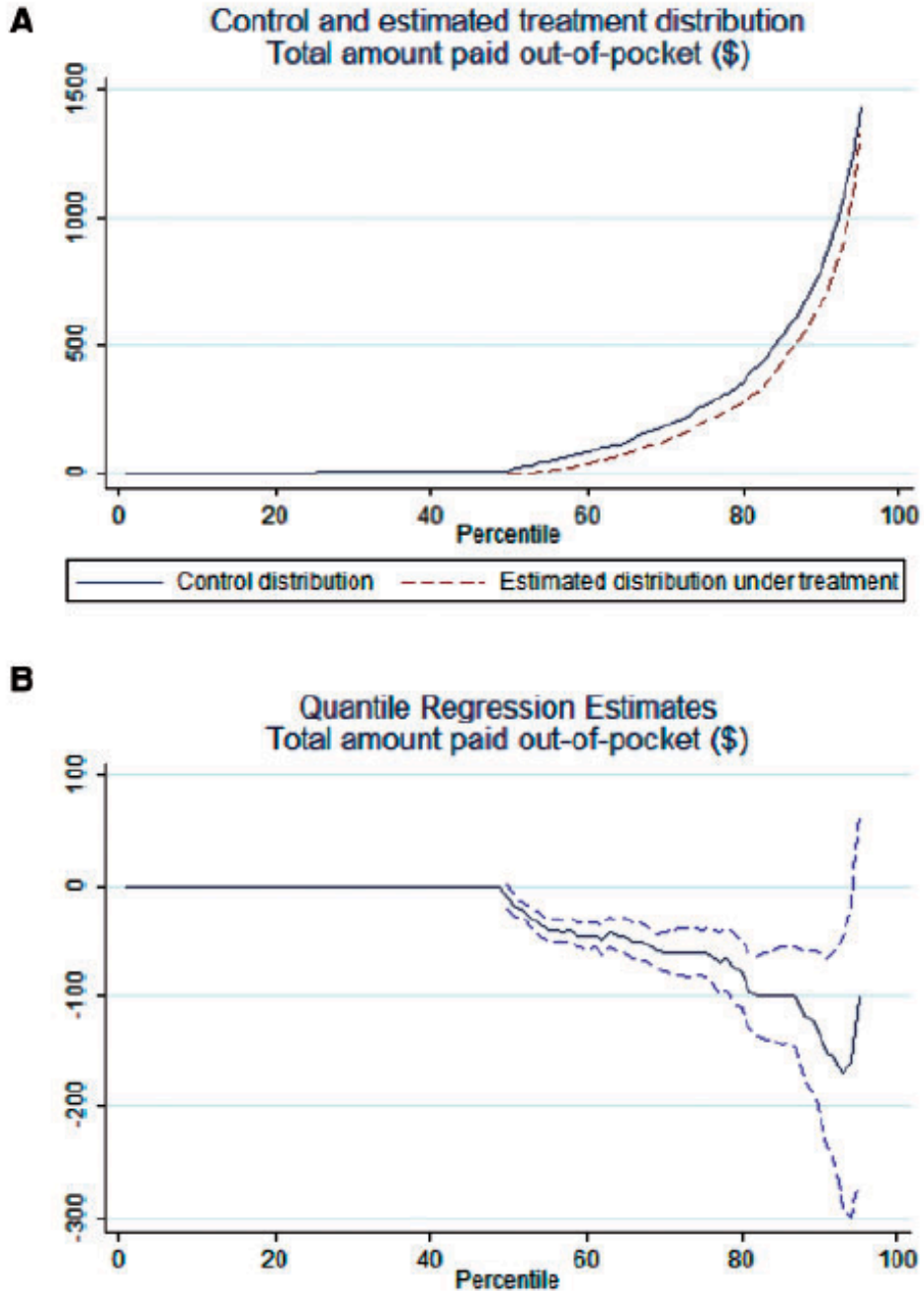

FIGURE I

Distribution of Out-of-Pocket Medical Expenses, Last Six Months (Survey Data)

TABLE IX

HEALTH

	Control mean (1)	ITT (2)	LATE (3)	*p*-values (4)
Panel A: Administrative data				
Alive	0.992	0.00032	0.0013	[0.638]
	(0.092)	(0.00068)	(0.0027)	
Panel B: Survey data				
Self-reported health good/very good/excellent (not fair or poor)	0.548	0.039	0.133	[<0.0001]
	(0.498)	(0.0076)	(0.026)	{<0.0001}
Self-reported health not poor (fair, good, very good, or excellent)	0.86	0.029	0.099	[<0.0001]
	(0.347)	(0.0051)	(0.018)	{<0.0001}
Health about the same or gotten better over last six months	0.714	0.033	0.113	[<0.0001]
	(0.452)	(0.0067)	(0.023)	{<0.0001}
# of days physical health good, past 30 days*	21.862	0.381	1.317	[0.019]
	(10.384)	(0.162)	(0.563)	{0.018}
# days poor physical or mental health did not impair usual activity, past 30 days*	20.329	0.459	1.585	[0.009]
	(10.939)	(0.175)	(0.606)	{0.015}
# of days mental health good, past 30 days*	18.738	0.603	2.082	[0.001]
	(11.445)	(0.184)	(0.64)	{0.003}
Did not screen positive for depression, last two weeks	0.671	0.023	0.078	[0.001]
	(0.470)	(0.0071)	(0.025)	{0.003}
Standardized treatment effect		0.059	0.203	[<0.0001]
		(0.011)	(0.039)	

TABLE X

POTENTIAL MECHANISMS FOR IMPROVED HEALTH (SURVEY DATA)

	Control mean (1)	ITT (2)	LATE (3)	*p*-values (4)
Panel A: Access to care				
Have usual place of clinic-based care	0.499	0.099	0.339	[<0.0001]
	(0.500)	(0.0080)	(0.027)	{<0.0001}
Have personal doctor	0.490	0.081	0.280	[<0.0001]
	(0.500)	(0.0077)	(0.026)	{<0.0001}
Got all needed medical care, last six months	0.684	0.069	0.239	[<0.0001]
	(0.465)	(0.0063)	(0.022)	{<0.0001}
Got all needed drugs, last six months	0.765	0.056	0.195	[<0.0001]
	(0.424)	(0.0055)	(0.019)	{<0.0001}
Didn't use ER for nonemergency, last six months	0.916	−0.0011	−0.0037	[0.804]
	(0.278)	(0.0043)	(0.015)	{0.804}
Standardized treatment effect		0.128	0.440	[<0.0001]
		(0.0084)	(0.029)	
Panel B: Quality of care				
Quality of care received last six months good/very good/excellent (conditional on any)	0.708	0.043	0.142	[<0.0001]
	(0.455)	(0.0081)	(0.027)	
Panel C: Happiness				
Very happy or pretty happy (vs. not too happy)	0.594	0.056	0.191	[<0.0001]
	(0.491)	(0.0074)	(0.026)	

TABLE XI

ESTIMATED EFFECTS OF LOTTERY AT DIFFERENT TIMES

	ITT estimates from survey			*p*-value of difference between		
	Initial (1)	Six month (2)	Main (3)	Initial and six month (4)	Six month and main (5)	Initial and main (6)
Utilization (extensive margin)	0.0038	0.047	0.050	0.035	0.867	<0.0001
	(0.0084)	(0.020)	(0.011)			
	[0.656]	[0.02]	[<0.0001]			
Utilization (total)	−0.00023	0.027	0.040	0.188	0.556	0.001
	(0.0086)	(0.020)	(0.011)			
	[0.978]	[0.187]	[0.0003]			
Financial strain	−0.035	−0.099	−0.089	0.002	0.613	<0.0001
	(0.0089)	(0.020)	(0.010)			
	[<0.0001]	[<0.0001]	[<0.0001]			
Health	0.042	0.097	0.061	0.014	0.121	0.112
	(0.010)	(0.023)	(0.011)			
	[<0.0001]	[<0.0001]	[<0.0001]			
Access	0.047	0.075	0.119	0.163	0.026	<0.0001
	(0.0078)	(0.019)	(0.0086)			
	[<0.0001]	[<0.0001]	[<0.0001]			