

Insurance Experiments

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Last Class

- ▶ Uninsureds in the U.S.
 - ▶ Many are able-bodied, working-class Americans.
 - ▶ Many have family incomes below 200% FPL (about \$24,000/year).
 - ▶ Hispanics make up a disproportionate share of the uninsured in comparison to the makeup of the population.
- ▶ Uncompensated care
 - ▶ When uninsureds get medical care, they only pay about 20% out of pocket.
 - ▶ The rest is uncompensated care.
 - ▶ Medical providers, federal, state, and local governments, and various grant providing organizations share in the cost of this uncompensated care.
 - ▶ Medicaid is the largest payer of uncompensated care
- ▶ Employer-provided health insurance
 - ▶ Became popular around WWII as a solution to wage controls

Cost Sharing

- ▶ One thing that is constantly debated with regards to health care is the idea of cost sharing.
- ▶ Cost sharing refers to shifting a greater share of health care expense and responsibility onto consumers.
- ▶ The question is: if consumers have to bear a larger burden of health insurance costs, how does this affect health care utilization and health status?
- ▶ The RAND Health Insurance Experiment (HIE) is often cited during discussions of cost sharing.

RAND HIE

Overview:

- ▶ The goal of the RAND experiment was to better understand what was driving the rising costs of medical care (in the 1970s).
- ▶ Many believed that it was the proliferation of health insurance.
- ▶ Most of the work studying insurance prior to the RAND study was primarily theoretical and lacked any empirical based evidence.
- ▶ Manning et al. (1987) is considered to be the “RAND” academic article, published in *The American Economic Review*.

RAND HIE

- ▶ The RAND HIE was a large-scale, randomized experiment aimed to test the effects of health insurance on the quantity and quality of health care demanded and subsequent health outcomes.
- ▶ The experiment was conducted from 1971-1982
- ▶ The experiment recruited 2,750 families encompassing more than 7,700 individuals, all of whom were under the age of 65.
- ▶ Individuals were chosen from six different sites across the U.S. to provide a regional and urban/rural balance.
- ▶ Participants were randomly assigned to 1 of 5 types of insurance plans and studied for 3-5 years. (Note the importance of random assignment).

RAND HIE

The RAND HIE featured 5 different plans:

One plan offered Free health care (0% coinsurance, some HMO-style plan)

Note: A Health Maintenance Organization (HMO) is an insurance group that provides health services for a fixed annual fee. Typically, an HMO covers care delivered by specific doctors who have agreed by contract to treat patients in accordance with HMO guidelines.

RAND HIE

Three plans offered varying levels of coinsurance.

- ▶ Each coinsurance plan had a maximum out-of-pocket limit (MDE) of 5%, 10%, 15% of income or \$1,000, whichever was greater (\$1,000 in 1971 is equivalent to \$5,942 today).
- ▶ 25% coinsurance
- ▶ 50% coinsurance
- ▶ 95% coinsurance

RAND HIE

Finally, the fifth type of plan called an “individual deductible” plan

- ▶ Maximum dollar expenditure of \$150 (\$891 today) per person, or \$450 (\$2,674 today) per family.
- ▶ This is effectively an example of a high-deductible catastrophic plan that we often hear discussed today.

RAND HIE

- ▶ Families participated in the experiment for 3-5 years, and the upper age limit for adults at the time of enrollment was 61 (so no participants would become eligible for Medicare before the experiment ended).
- ▶ In order to access participant service use, costs, and quality of care, RAND served as the insurance company and processed individual's claims.
- ▶ To access participant health, RAND administered surveys at the beginning and end of the experiment
- ▶ RAND conducted comprehensive physical exams. Only a random 60% received pre-experiment physicals, while everyone received post-experiment physicals. The random use of physicals pre-experiment was intended to help control for endogeneity of health outcomes (i.e. the physical at the beginning might spark some health effects).

TABLE 1—NUMBER OF PERSONS AT ENROLLMENT AND NUMBER OF PERSON-YEARS IN ESTIMATION SAMPLE

Plan	Site						Enrollment Total ^a	Estimation Sample Total ^b
	Dayton	Seattle	Fitchburg	Franklin County	Charleston	Georgetown		
Free	301	431	241	297	264	359	1893	6822
25 Percent ^c	260	253	125	152	146	201	1137	4065
50 Percent	191	0	56	58	26	52	383	1401
95 Percent	280	253	113	162	146	166	1120	3727
Individual								
Deductible	105	285	188	220	196	282	1276	4175
Total	1137	1222	723	889	778	1060	5809	20190

^a Persons.

^b Person-years.

^c Includes those with 50 percent coinsurance for dental and mental health and 25 percent coinsurance for all other services.

RAND HIE

TABLE 2—SAMPLE MEANS FOR ANNUAL USE OF MEDICAL SERVICES PER CAPITA

Plan	Face-to-Face Visits	Outpatient Expenses (1984 \$)	Admissions	Inpatient Dollars (1984 \$)	Prob. Any Medical (%)	Prob. Any Inpatient (%)	Total Expenses (1984 \$)	Adjusted Total Expenses (1984 \$) ^a
Free	4.55 (.168)	340 (10.9)	.128 (.0070)	409 (32.0)	86.8 (.817)	10.3 (.45)	749 (39)	750 (39)
25 Percent	3.33 (.190)	260 (14.70)	.105 (.0090)	373 (43.1)	78.8 (1.38)	8.4 (0.61)	634 (53)	617 (49)
50 Percent	3.03 (.221)	224 (16.8)	.092 (.0116)	450 (139)	77.2 (2.26)	7.2 (0.77)	674 (144)	573 (100)
95 Percent	2.73 (.177)	203 (12.0)	.099 (.0078)	315 (36.7)	67.7 (1.76)	7.9 (0.55)	518 (44.8)	540 (47)
Individual Deductible	3.02 (.171)	235 (11.9)	.115 (.0076)	373 (41.5)	72.3 (1.54)	9.6 (0.55)	608 (46)	630 (56)
<i>Chi-Squared (4)^b</i>	68.8	85.3	11.7	4.1	144.7	19.5	15.9	17.0
<i>P Value for chi-Squared (4)</i>	<.0001	<.0001	.02	n.s.	<.0001	.0006	.003	.002

Note: All standard errors (shown in parentheses) are corrected for intertemporal and intrafamily correlations. Dollars are expressed in June 1984 dollars. Visits are face-to-face contacts with MD, DO, or other health providers; excludes visits for only radiology, anesthesiology or pathology services. Visits and expenses exclude dental care and outpatient psychotherapy.

RAND HIE

So the RAND study shows:

- ▶ Individuals with free insurance go to the doctor on average 5 times per year, while individuals with a 95% copayment go 3 times per year.
- ▶ Individuals with a catastrophic plan (95% copayment) spend about 31% less on health care than those with free plans.
- ▶ This results in a price elasticity of demand of about -0.2.
- ▶ So if people with free insurance go to the doctor more, are they healthier on average?

RAND HIE

RAND also tracked health outcomes of individuals within the experiment.

- ▶ According to Manning et al. (1987), free insurance had no effect on health of normal adults.
- ▶ Free service did appear to improve the health of poor adults with high blood pressure:

“there was a clinically significant reduction in blood pressure in the free fee-for-service plan compared to the plans with cost sharing. The magnitude of this reduction would lower mortality about 10 percent each year among this group, about 6 percent of the population”

- ▶ This brings about the question of whether it is worth it to have health insurance, or just programs targeted for prevalent, inexpensive chronic diseases?

Welfare Implications from RAND

Recall that insurance creates a form of moral hazard:

- ▶ insurance induces individuals to consume more health care (they do not fully internalize the marginal cost of additional consumption).
- ▶ In some cases, insurance will lead an individual to consume health care at points in which $MC > MB$ (because the person does not realize the true cost).

The Oregon HIE

- ▶ In 2008, Oregon implemented a limited expansion of its Medicaid program.
- ▶ They randomly selected 30,000 low income adults from a waiting list of 90,000 people.
- ▶ Selected adults won the opportunity to apply for Medicaid and to enroll if they met eligibility requirements.
- ▶ To be eligible, they had to be Oregon residents who are U.S. citizens or legal immigrants ages 19-64, ineligible for other forms of public insurance, uninsured for the previous six months with an income of less than 100% FPL and with assets of less than \$2,000.
- ▶ This lottery acted as a form of randomization to study the effects of Medicaid expansion.

The Oregon HIE

- ▶ There are two popular academic articles studying the Oregon HIE: Finkelstein (2012) published in the *Quarterly Journal of Economics* and Baiker et al. (2013) published in the *New England Journal of Medicine*.
- ▶ Baiker et al. (2013) focus on a sample of people from Portland, Oregon. Specifically, they look at 10,405 people selected into the lottery (lottery winners) and 10,340 people not selected (lottery losers).
- ▶ They perform in-person interviews and ask people questions in 2009 and 2010, an average of 25 months after the lottery.
- ▶ Questions asked include those that relate to health care, health status, insurance status, measurements of blood pressure, depression and self-reported health-related quality of life.

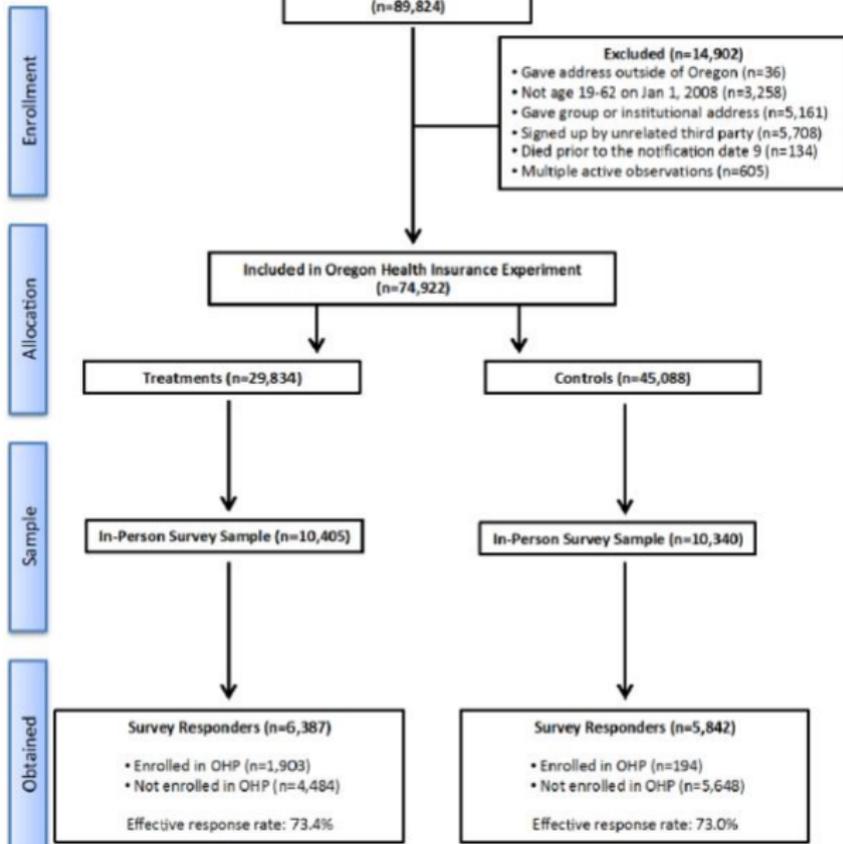


Table 5. Mean Values and Absolute Change in Health Care Utilization and Spending, Preventive Care, Access to and Quality of Care, and Smoking and Obesity with Medicaid Coverage.^{2*}

Variable	Mean Value in Control Group	Change with Medicaid Coverage (95% CI)†	P Value
Utilization (no. of visits or medications)			
Current prescription drugs	1.8±2.8	0.66 (0.21 to 1.11)	0.004
Office visits in past 12 mo	5.5±11.6	2.70 (0.91 to 4.49)	0.003
Outpatient surgery in past 12 mo	0.1±0.4	0.03 (-0.03 to 0.09)	0.28
Emergency department visits in past 12 mo	1.0±2.0	0.09 (-0.23 to 0.42)	0.57
Hospital admissions in past 12 mo	0.2±0.6	0.07 (-0.03 to 0.17)	0.17
Estimate of annual health care spending (\$)‡	3,257.3	1,171.63 (199.35 to 2,143.91)	0.018
Preventive care in past 12 mo (%)			
Cholesterol-level screening	27.2	14.57 (7.09 to 22.04)	<0.001
Fecal occult-blood test in persons ≥50 yr	19.1	1.26 (-9.44 to 11.96)	0.82
Colonoscopy in persons ≥50 yr	10.4	4.19 (-4.25 to 12.62)	0.33
Flu shot in persons ≥50 yr	35.5	-5.74 (-19.31 to 7.83)	0.41
Papanicolaou smear in women	44.9	14.44 (2.64 to 26.24)	0.016
Mammography in women ≥50 yr	28.9	29.67 (11.96 to 47.37)	0.001
PSA test in men ≥50 yr	21.4	19.18 (1.14 to 37.21)	0.037
Perceived access to and quality of care (%)			
Had a usual place of care	46.1	23.75 (15.44 to 32.06)	<0.001
Received all needed care in past 12 mo	61.0	11.43 (3.62 to 19.24)	0.004
Care was of high quality, if received, in past 12 mo	78.4	9.85 (2.71 to 17.00)	0.007
Smoking status and obesity (%)			
Current smoker	42.8	5.58 (-2.54 to 13.70)	0.18
Obese	41.5	0.39 (-7.89 to 8.67)	0.93

Table 3. Mean Values and Absolute Change in Health-Related Quality of Life and Happiness with Medicaid Coverage.*

Variable	Mean Value in Control Group	Change with Medicaid Coverage (95% CI) [†]	P Value
Health-related quality of life			
Health same or better vs. 1 yr earlier (%)	80.4	7.84 (1.45 to 14.23)	0.02
SF-8 subscale [‡]			
Mental-component score	44.4±11.4	1.95 (0.03 to 3.88)	0.05
Physical-component score	45.5±10.5	1.20 (-0.54 to 2.93)	0.18
No pain or very mild pain (%)	56.4	1.16 (-6.94 to 9.26)	0.78
Very happy or pretty happy (%)	74.9	1.18 (-5.85 to 8.21)	0.74

Table 2. Mean Values and Absolute Change in Clinical Measures and Health Outcomes with Medicaid Coverage.*

Variable	Mean Value in Control Group	Change with Medicaid Coverage (95% CI)†‡	P Value
Blood pressure			
Systolic (mm Hg)	119.3±16.9	-0.52 (-2.97 to 1.93)	0.68
Diastolic (mm Hg)	76.0±12.1	-0.81 (-2.65 to 1.04)	0.39
Elevated (%)‡	16.3	-1.33 (-7.16 to 4.49)	0.65
Hypertension			
Diagnosis after lottery (%)§¶	5.6	1.76 (-1.89 to 5.40)	0.34
Current use of medication for hypertension (%)§¶	13.9	0.66 (-4.48 to 5.80)	0.80
Cholesterol†**			
Total level (mg/dl)	204.1±34.0	2.20 (-3.44 to 7.84)	0.45
High total level (%)	14.1	-2.43 (-7.75 to 2.89)	0.37
HDL level (mg/dl)	47.6±13.1	0.83 (-1.31 to 2.98)	0.45
Low HDL level (%)	28.0	-2.82 (-10.28 to 4.64)	0.46
Hypercholesterolemia			
Diagnosis after lottery (%)§¶	6.1	2.39 (-1.52 to 6.29)	0.23
Current use of medication for high cholesterol level (%)§¶	8.5	3.80 (-0.75 to 8.35)	0.10
Glycated hemoglobin			
Level (%)	5.3±0.6	0.01 (-0.09 to 0.11)	0.82
Level ≥6.5% (%)††	5.1	-0.93 (-4.44 to 2.59)	0.61
Diabetes			
Diagnosis after lottery (%)§¶	1.1	3.83 (1.93 to 5.73)	<0.001
Current use of medication for diabetes (%)§¶	6.4	5.43 (1.39 to 9.48)	0.008

Table 2. (Continued.)

Variable	Mean Value in Control Group	Change with Medicaid Coverage (95% CI)†	P Value
Depression			
Positive screening result (%)‡‡	30.0	-9.15 (-16.70 to -1.60)	0.02
Diagnosis after lottery (%)§¶	4.8	3.81 (0.15 to 7.46)	0.04
Current use of medication for depression (%)§§	16.8	5.49 (-0.46 to 11.45)	0.07
Framingham risk score (%)§§			
Overall	8.2±7.5	-0.21 (-1.56 to 1.15)	0.76
High-risk diagnosis	11.6±8.3	1.63 (-1.11 to 4.37)	0.24
Age of 50–64 yr	13.9±8.2	-0.37 (-2.64 to 1.90)	0.75

Table 4. Mean Values and Absolute Change in Financial Hardship with Medicaid Coverage.*

Variable	Mean Value in Control Group	Change with Medicaid Coverage (95% CI)†	P Value
Any out-of-pocket spending (%)	58.8	-15.30 (-23.28 to -7.32)	<0.001
Amount of out-of-pocket spending (\$)	552.8±1219.5	-215.35 (-408.75 to -21.95)	0.03
Catastrophic expenditures (%)‡	5.5	-4.48 (-8.26 to -0.69)	0.02
Any medical debt (%)	56.8	-13.28 (-21.59 to -4.96)	0.002
Borrowed money to pay bills or skipped payment (%)	24.4	-14.22 (-21.02 to -7.43)	<0.001

RAND HIE vs Oregon HIE

“RAND found that moving from the least comprehensive insurance plan -which still offered considerable insurance coverage to full insurance, was associated with a 45% increase in annual spending, whereas our back-of-the-envelope calculation suggests that relative to being uninsured, Medicaid was associated with a 25% increase in six-month spending. The same insurance variation in RAND also produced about a 75% increase in the number of annual outpatient visits, compared with the 55% increase we estimated.”

Finkelstein et al. (2012)

Summary

- ▶ The RAND and Oregon HIEs are two major explorations in the effects of health insurance coverage on utilization and health outcomes.
- ▶ Both rely on randomization so as to not systematically bias any results.
- ▶ Each study finds that having more complete health insurance coverage leads to significant increases in health care utilization, however effects on health status are less clear.
- ▶ RAND finds improvements in blood pressure among the poor, and Oregon finds improvements in mental health (perhaps due to less stress related to health expenses).

Next Class

Affordable Care Act