Affordable Care Act (2010)

- Primarily designed to ↑ insurance coverage
- Kept current system
- Fill in the “holes” in current coverage
  - Expand Medicaid eligibility
  - “Pay or play” – firms w/ 50+ employees fined if they do not provide health insurance
  - Individual Mandate – families fined for not having ins.
  - Exchanges – markets where individuals and small businesses can purchase insurance @ group rates

Insurance coverage by type, 2014

- Any insurance 89.6%
- Any Private 66.0%
  - Employment based 55.4%
  - Direct purchase 14.6%
- Any government 36.5%
  - Medicare 16.0%
  - Medicaid 19.5%
  - Military 4.5%
- Uninsured 10.4%
Uninsurance rates for adults 18-64, 2014

- All 14.2
- Marital status
  - Married 10.3
  - Divorced 17.1
  - Separated 24.8
  - Never married 18.5
- Work experience
  - Full time/year 11.2
  - < full year 17.7
  - Did not work 17.8
- By education
  - <HS 38.2
  - HS grad 17.7
  - Associate deg. 10.4
  - College 8.0
  - Grad degree 5.1
- By income
  - <$25K 16.6
  - $25K - $50K 14.1
  - $50K - $75K 10.7
  - $75K - $100K 8.0
  - ≥$100K 5.3

Research Question

- What is the elasticity of demand for medical care?
- Why important?
  - ACA will expand coverage to millions
  - Need to know the impact on Federal and state spending
- Problem: People with insurance are not a random sample of the population – so estimating demand curves difficult
Some term we might need

• Copay – a dollar amount a person pays out of pocket for a medical service (e.g., $15/visit or $5/prescription)
• Coinsurance rate – fraction of a medical cost that is paid out of pocket
• Deductible – an amount a person has to pay out of pocket before insurance kicks in

Cross-sectional regression

\[ y_i = \alpha + x_i \beta + COINS_i \delta + \varepsilon_i \]

where: \( y_i \) = health care spending for person \( i \)
\( x_i \) = other controls
\( COINS_i \) = coinsurance rate
\( \varepsilon_i \) = error

RAND Health Ins. Experiment

• Run 1974-1982
• 2000 families randomly assigned
• Four sites
  – Dayton, Seattle, MA, SC
• Four coinsurance rates
  – 0, 25, 50 and 95%
• Also HMO comparison w/ 0% coinsurance
• 3-5 years

Annual Per Capita Medical Use

<table>
<thead>
<tr>
<th>Plan</th>
<th>Visits</th>
<th>Outpat. $</th>
<th>Hosp Admits</th>
<th>Hosp $</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free</td>
<td>4.55</td>
<td>$630</td>
<td>0.128</td>
<td>$769</td>
<td>$1410</td>
</tr>
<tr>
<td>25%</td>
<td>3.33</td>
<td>$489</td>
<td>0.105</td>
<td>$701</td>
<td>$1160</td>
</tr>
<tr>
<td>50%</td>
<td>3.03</td>
<td>$421</td>
<td>0.092</td>
<td>$846</td>
<td>$1078</td>
</tr>
<tr>
<td>95%</td>
<td>2.73</td>
<td>$382</td>
<td>0.099</td>
<td>$592</td>
<td>$1016</td>
</tr>
</tbody>
</table>

Real 2005 dollars
Oregon Medicaid Lottery

- OHP Plus
  - Serves traditional Medicaid patients
  - Low income pregnant women and children, disabled, families on welfare
- OHP Standard
  - Adults aged 19-64 – low income but not eligible for public insurance
  - Uninsured > 6 months (why)
  - Low assets

OHP Standard

- Comprehensive benefits with low cost sharing
  - Everything but vision and non-emergency dental
- Care provided by managed care groups
- Annual spending/year is $3000
- Premiums based on income with many paying nothing

OHP Standard

- Peak enrollment was 100K in 2002
- Stopped taking new enrollees in 2004 due to budget
- By 2008, attrition reduced plan to 19K
- State had money to enroll an additional 10K
- Expected high demand (90K applied)
- Used lottery to determine access

OHP Standard

- ~ 36K were selected in the lottery
- 10K were eligible
  - 60% did not return forms
  - Rest had quarterly income that was too high
- If enrolled, stayed in program indefinitely
  - Need to re-certify every 6 month
Data

- Demographic and income data
  - From application
- Administrative
  - Measures hospital discharge
  - Rare (<5%) but 25% of costs
- Credit reports
  - Able to match 68.5%

Data

- Survey data
  - Measures dr. visits and health outcomes
  - Only 50% response rate
  - 16 months after notice and 13 months after entry
### Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group Mean</th>
<th>( \bar{Y}_1 ) Difference (std. error)</th>
<th>Group</th>
<th>( \bar{Y}_1 ) Difference (std. error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of birth</td>
<td>1968</td>
<td>0.16 (0.10)</td>
<td>Gave phone #</td>
<td>0.862 (0.0029)</td>
</tr>
<tr>
<td>Female</td>
<td>0.56</td>
<td>-0.007 (0.003)</td>
<td>Address is PO box</td>
<td>0.117 (0.0004)</td>
</tr>
<tr>
<td>Respondent lives in city?</td>
<td>0.773</td>
<td>-0.0024 (0.0036)</td>
<td>Signed up self</td>
<td>0.918 (0.0024)</td>
</tr>
<tr>
<td>Signed up 1st day</td>
<td>0.093</td>
<td>-0.0012 (0.0025)</td>
<td>Median HH income in Zip</td>
<td>$39,265 (44.9)</td>
</tr>
</tbody>
</table>

### Comparison of means

\[
x_i = \gamma_0 + LOTTERY_i \gamma_1 + \eta_i
\]

### First stage

\[
INSURANCE_i = \delta_0 + LOTTERY_i \delta_1 + X_i \delta_2 + V_i \delta_3 + u_i
\]

where:

- \( INSURANCE_i = 1 \) if have insurance
- \( LOTTERY_i = 1 \) if was offered MEDICAID through lottery
- \( X_i \) and \( V_i = controls \)

### Intention to treat

\[
Y_i = \beta_0 + LOTTERY_i \beta_1 + X_i \beta_2 + V_i \beta_3 + \epsilon_i
\]

where:

- \( Y_i = measures of health care use \)
- \( LOTTERY_i = 1 \) if was offered MEDICAID through lottery
- \( X_i \) and \( V_i = controls \)
\[ \beta_1 = \frac{\partial \text{Use}/ \partial \text{Lottery}}{= 0.0054} \]

\[ \delta_1 = \frac{\partial \text{Medicaid}/ \partial \text{Lottery}}{= 0.256} \]

\[ \pi_1 = \frac{\beta_1}{\delta_1} = \frac{0.0054}{0.256} = 0.021 \]

\[ \text{LATE for outpatient (total use)} \]

\[ \pi_1 = \frac{\partial \text{Use}/ \partial \text{Lottery}}{= 0.314} \]

\[ \theta_1 = \frac{\partial \text{Medicaid}/ \partial \text{Lottery}}{= 0.290} \]

\[ \beta_1 = \frac{\pi_1}{\theta_1} = \frac{0.314}{0.290} = 1.083 \]

\[ \xi_d = \frac{\%\Delta Q}{\%\Delta P} = \frac{\frac{Q_2 - Q_1}{P_1}}{P_2 - P_1} \]

\[ \text{Arc } \xi_d = \frac{\frac{Q_2 - Q_1}{2}}{P_2 - P_1} = \frac{Q_1 - Q_2}{P_1 - P_2} \]
Comparison w. RAND (Inpatient)

- $P_2=0, P_1=1$, so $(P_2-P_1)/(P_2+P_1)=-1$
- Arc $\xi_d=\Delta Q/(Q_2+Q_1)/(-1)$
  - $\Delta Q$ is LATE
  - $Q_1$ is without insurance
  - $Q_2=Q_1+\Delta Q$
- Hospital
  - $Q_1=0.067$
  - $\Delta Q=0.021$
  - $Q_2=0.067+0.021=0.088$
  - $\xi_d=\Delta Q/(Q_2+Q_1)=-0.021/(0.088+0.067)=-0.135$
  - RAND HIE was -0.14

Comparison w. RAND (MD visits)

- $P_2=0, P_1=1$, so $(P_2-P_1)/(P_2+P_1)=-1$
- Arc $\xi_d=\Delta Q/(Q_2+Q_1)/(-1)$
  - $\Delta Q$ is LATE
  - $Q_1$ is without insurance
  - $Q_2=Q_1+\Delta Q$
- Outpatient visits
  - $Q_1=1.91$
  - $\Delta Q=1.08$
  - $Q_2=1.91+1.08=2.99$
  - $\xi_d=\Delta Q/(Q_2+Q_1)=-1.08/(1.91+2.99)=-0.22$
  - RAND HIE was -0.17
Impact of Oregon on Clinical Outcomes

- 2nd year followup of the Oregon experiment
- Participants Interviewed from 9/09 to 10/10
  - 25 months after the lottery
  - Survey data on health status
  - Anthropomorphic data
  - Blood spots
  - Short form depression survey

Risky levels for biomarkers

- High total cholesterol, ≥240 mg/dl
- Low HDL, <40 mg/dl
- High glycated hemoglobin, ≥6.4%
- High systolic, ≥140 mm Hg
- High diastolic, ≥90 mm Hg
Table 2: Mean Values and Absolute Change in Clinical Measures and Health Outcomes with Medicaid Coverage.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Value</th>
<th>Change with Medicaid Coverage (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic (mm Hg)</td>
<td>129.3±13.9</td>
<td>−5.2 (−7.9 to −2.5)</td>
<td>0.001</td>
</tr>
<tr>
<td>Diastolic (mm Hg)</td>
<td>76.0±12.1</td>
<td>−0.8 (−1.9 to 0.3)</td>
<td>0.19</td>
</tr>
<tr>
<td>Elevated (%)</td>
<td>16.3</td>
<td>−13.2 (−16.4 to −9.9)</td>
<td>0.001</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes after 1 year (%)</td>
<td>3.6</td>
<td>1.7 (1.1 to 2.4)</td>
<td>0.001</td>
</tr>
<tr>
<td>Current use of metformin</td>
<td>13.9</td>
<td>0.6 (−0.1 to 1.5)</td>
<td>0.08</td>
</tr>
<tr>
<td>Cholesterol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (mg/dl)</td>
<td>198.1±44.0</td>
<td>2.2 (−3.4 to 7.9)</td>
<td>0.45</td>
</tr>
<tr>
<td>High total level (%)</td>
<td>14.1</td>
<td>−7.4 (−12.8 to 2.9)</td>
<td>0.17</td>
</tr>
<tr>
<td>HDL level (mg/dl)</td>
<td>57.6±13.1</td>
<td>0.3 (−1.5 to 3.3)</td>
<td>0.45</td>
</tr>
<tr>
<td>Low HDL level (%)</td>
<td>28.0</td>
<td>−2.2 (−10.2 to 5.6)</td>
<td>0.60</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Value</th>
<th>Change with Medicaid Coverage (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health-related quality of life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health same as better vs. 1 yr ago (%)</td>
<td>80.8</td>
<td>7.8 (−4.3 to 14.2)</td>
<td>0.01</td>
</tr>
<tr>
<td>ST-6 subscale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental component score</td>
<td>44.6±11.4</td>
<td>1.9 (0.9 to 3.0)</td>
<td>0.05</td>
</tr>
<tr>
<td>Physical component score</td>
<td>45.5±10.5</td>
<td>1.2 (0.4 to 3.0)</td>
<td>0.04</td>
</tr>
<tr>
<td>No pain or very mild pain (%)</td>
<td>26.8</td>
<td>1.1 (−0.4 to 3.6)</td>
<td>0.23</td>
</tr>
<tr>
<td>Very happy or pretty happy (%)</td>
<td>74.0</td>
<td>1.8 (−0.5 to 4.2)</td>
<td>0.24</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Value</th>
<th>Change with Medicaid Coverage (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any out-of-pocket spending (%)</td>
<td>58.8</td>
<td>−15.2 (−19.2 to −11.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Amount of out-of-pocket spending ($)</td>
<td>552.8±118.5</td>
<td>−215.15 (−406.75 to −21.15)</td>
<td>0.03</td>
</tr>
<tr>
<td>Catastrophic expenditures (%)</td>
<td>5.5</td>
<td>−4.8 (−8.6 to −1.01)</td>
<td>0.02</td>
</tr>
<tr>
<td>Any medical debt (%)</td>
<td>56.8</td>
<td>−13.28 (−25.39 to −1.16)</td>
<td>0.002</td>
</tr>
<tr>
<td>Borrowed money to pay bills (%)</td>
<td>24.4</td>
<td>−14.12 (−21.01 to −7.25)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Value</th>
<th>Change with Medicaid Coverage (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilization (no. of visits or medications)</td>
<td>3.6±2.8</td>
<td>0.6 (0.2 to 1.1)</td>
<td>0.004</td>
</tr>
<tr>
<td>Office visits in past 12 mos</td>
<td>3.5±1.6</td>
<td>2.7 (0.9 to 4.4)</td>
<td>0.003</td>
</tr>
<tr>
<td>Outpatient surgery in past 12 mos</td>
<td>0.5±0.4</td>
<td>0.1 (−0.3 to 0.6)</td>
<td>0.28</td>
</tr>
<tr>
<td>Emergency department visits in past 12 mos</td>
<td>0.6±0.4</td>
<td>0.0 (−0.3 to 0.6)</td>
<td>0.27</td>
</tr>
<tr>
<td>Hospital admissions in past 12 mos</td>
<td>0.2±0.4</td>
<td>0.0 (−0.3 to 0.6)</td>
<td>0.07</td>
</tr>
<tr>
<td>Cost of annual health care spending ($)</td>
<td>3,25±1.3</td>
<td>1,171.55 (293.99 to 1,961.11)</td>
<td>0.018</td>
</tr>
<tr>
<td>Preventive care in past 12 mos (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol level screening</td>
<td>77.2</td>
<td>14.57 (7.09 to 22.06)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Fecal occult blood test in persons ≥65 yr</td>
<td>19.1</td>
<td>1.2 (−0.4 to 3.6)</td>
<td>0.32</td>
</tr>
<tr>
<td>Colonoscopy in persons ≥65 yr</td>
<td>10.4</td>
<td>4.19 (−1.2 to 10.6)</td>
<td>0.02</td>
</tr>
<tr>
<td>Flu shot in persons ≥65 yr</td>
<td>13.3</td>
<td>−3.74 (−9.31 to 1.83)</td>
<td>0.11</td>
</tr>
<tr>
<td>Pap smear in women</td>
<td>49.9</td>
<td>14.24 (6.64 to 21.84)</td>
<td>0.017</td>
</tr>
<tr>
<td>Mammography in women ≥35 yr</td>
<td>28.9</td>
<td>29.67 (11.96 to 47.37)</td>
<td>0.001</td>
</tr>
<tr>
<td>PSA test in men ≥50 yr</td>
<td>21.4</td>
<td>19.18 (1.34 to 37.15)</td>
<td>0.017</td>
</tr>
</tbody>
</table>