

The RAND Health Insurance Experiment, Three Decades Later

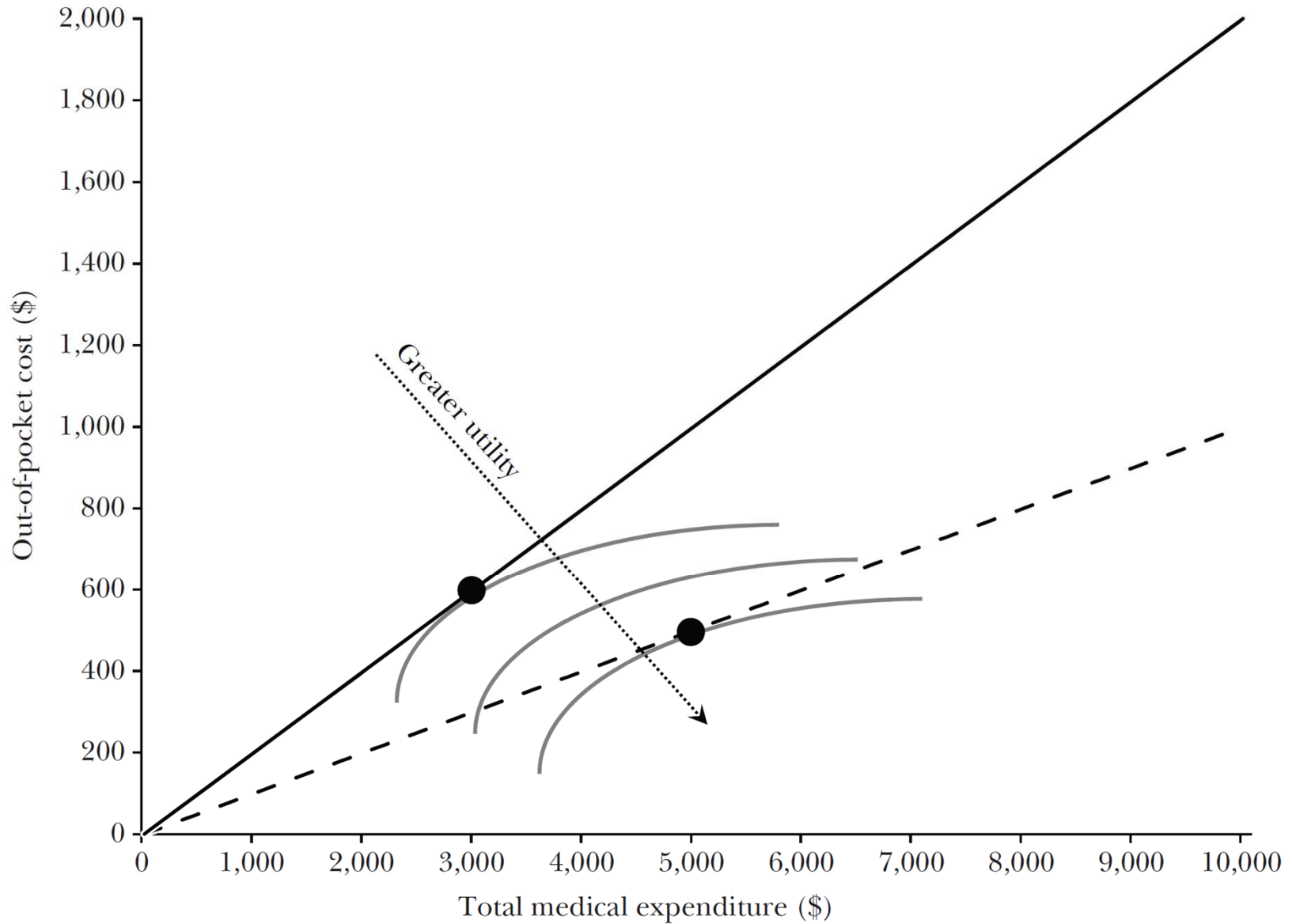
Aviva Aron-Dine, Liran Einav, Amy Finkelstein

Journal of Economic Perspectives 2013,
27(1):197–222

Ellis Notes

Figure 1

The Price Elasticity of Healthcare Utilization: A Hypothetical Example



A Brief Summary of the RAND Health Insurance Experiment 1971-1975

5 years, 7 sites chosen to be nationally representative

Families were assigned to plans with one of six consumer coinsurance rates

Four plans simply set different overall coinsurance rates of 95, 50, 25, or 0 % (=“free care”).

A “mixed coinsurance rate” with 25 percent for most services, but 50 percent for dental and outpatient mental health services

Individual deductible plan coinsurance rate of 95 percent for outpatient services

Stoploss = “Maximum Dollar Expenditure limits”

Set at 5, 10, or 15 % of family income, up to a maximum of \$750 or \$1,000 (roughly \$3,000 or \$4,000 in 2011 dollars).

On average, about one-third of the individuals hit their MDE.

Table 1

Plan Summary Statistics and Refusal and Attrition Rates

<i>Plan</i>	<i>Individuals (families)</i>	<i>Average out-of-pocket share^c</i>	<i>Share refusing enrollment</i>	<i>Share attriting</i>	<i>Share refusing or attriting</i>
Free Care	1,894 (626)	0%	6%	5%	12%
25% Coinsurance	647 (224)	23%	20%	6%	26%
Mixed Coinsurance ^a	490 (172)	28%	19%	9%	26%
50% Coinsurance	383 (130)	44%	17%	4%	21%
Individual Deductible ^b	1,276 (451)	59%	18%	13%	28%
95% Coinsurance	1,121 (382)	76%	24%	17%	37%
All plans	5,811 (1,985)	34%	16%	10%	24%
<i>p</i> -value, all plans equal			< 0.0001	< 0.0001	< 0.0001
<i>p</i> -value, Free Care vs. 95%			< 0.0001	< 0.0001	< 0.0001
<i>p</i> -value, Free Care vs. 25%			0.0001	0.5590	0.0001
<i>p</i> -value, 25% vs. 95%			0.4100	0.0003	0.0136

Empirical model

The baseline regression takes the form of

$$y_{i,t} = \lambda_p + \tau_t + \alpha_{l,m} + \varepsilon_{i,t}$$

- $y_{i,t}$ = *outcome* (for example, medical expenditure)
- explanatory variables are plan (p), year (t), and location-by-start-month (m) fixed effects.

Table 2

Plans' Effects on Utilization

	<i>Total spending^a</i>		<i>Inpatient spending</i>		<i>Outpatient spending</i>	
	<i>Share with any</i> (1)	<i>Spending in \$</i> (2)	<i>Share with any</i> (3)	<i>Spending in \$</i> (4)	<i>Share with any</i> (5)	<i>Spending in \$</i> (6)
Constant (Free Care Plan, N = 6,840)	0.931 (0.006)	2,170 (78)	0.103 (0.004)	827 (60)	0.930 (0.006)	1,343 (35)
25% Coinsurance (N = 2,361)	-0.079 (0.015)	-648 (152)	-0.022 (0.009)	-229 (116)	-0.078 (0.015)	-420 (62)
Mixed Coinsurance (N = 1,702)	-0.053 (0.015)	-377 (178)	-0.018 (0.009)	21 (141)	-0.053 (0.016)	-398 (70)
50% Coinsurance (N = 1,401)	-0.100 (0.019)	-535 (283)	-0.031 (0.009)	4 (265)	-0.100 (0.019)	-539 (77)
Individual Deductible (N = 4,175)	-0.124 (0.012)	-473 (121)	-0.006 (0.007)	-67 (98)	-0.125 (0.012)	-406 (52)
95% Coinsurance (N = 3,724)	-0.170 (0.015)	-845 (119)	-0.024 (0.007)	-217 (91)	-0.171 (0.016)	-629 (50)
<i>p</i> -value: all differences from Free Care = 0	< 0.0001	< 0.0001	0.0008	0.1540	< 0.0001	< 0.0001

Reshaping of Table 2: 1

Table 2						
Plans' Effects on Utilization						
	Total spending		Inpatient spending		Outpatient spending	
	Share > 0	Spending in \$	Share > 0	Spending in \$	Share > 0	Spending in \$
Free Care Plan (constant)	0.931	2,170	0.103	827	0.93	1,343
25% Coinsurance	-0.079	-648	-0.022	-229	-0.078	-420
Mixed	-0.053	-377	-0.018	21	-0.053	-398
50% plan	-0.1	-535	-0.031	4	-0.1	539
Individual	-0.124	-473	-0.006	-67	-0.125	406
95% plan	-0.17	-845	-0.024	-217	-0.171	-629
p- value ondifferences from free care plan	<0.0001	<0.0001	0.0008	0.154	<0.0001	<0.0001

Reshaping of Table 2: 2

Table 2A						
Plans' Effects on Utilization						
	Total spending		Inpatient spending		Outpatient spending	
	Share > 0	Spending in \$	Share > 0	Spending in \$	Share > 0	Spending in \$
Free Care Plan (constant)	0.931	2,170	0.103	827	0.93	1,343
25% Coinsurance	0.852	1522	0.081	598	0.852	923
Mixed	0.878	1793	0.085	848	0.877	945
50% plan	0.831	1635	0.072	831	0.83	1882
Individual	0.807	1697	0.097	760	0.805	1749
95% plan	0.761	1325	0.079	610	0.759	714
p- value ondifferences from free care plan	<0.0001	<0.0001	0.0008	0.154	<0.0001	<0.0001

Reshaping of Table 2: 3

	Total spending		Inpatient spending		Outpatient spending	
	Share > 0 (1)	Spending in \$ (3)	Share > 0 (2)	Spending in \$ (4)	Share > 0 (3)	Spending in \$ (6)
Free Care Plan (constant)	1.00	1.00	1.00	1.00	1.00	1.00
25% Coinsurance	0.92	0.70	0.79	0.72	0.92	0.69
Mixed	0.94	0.83	0.83	1.03	0.94	0.70
50% plan	0.89	0.75	0.70	1.00	0.89	1.40
Individual	0.87	0.78	0.94	0.92	0.87	1.30
95% plan	0.82	0.61	0.77	0.74	0.82	0.53
p- value ondifferences from free care plan	<0.0001	<0.0001	0.0008	0.154	<0.0001	<0.0001

Results from AronDine, Einav, Finkelsetin JEP 2013, Table 2

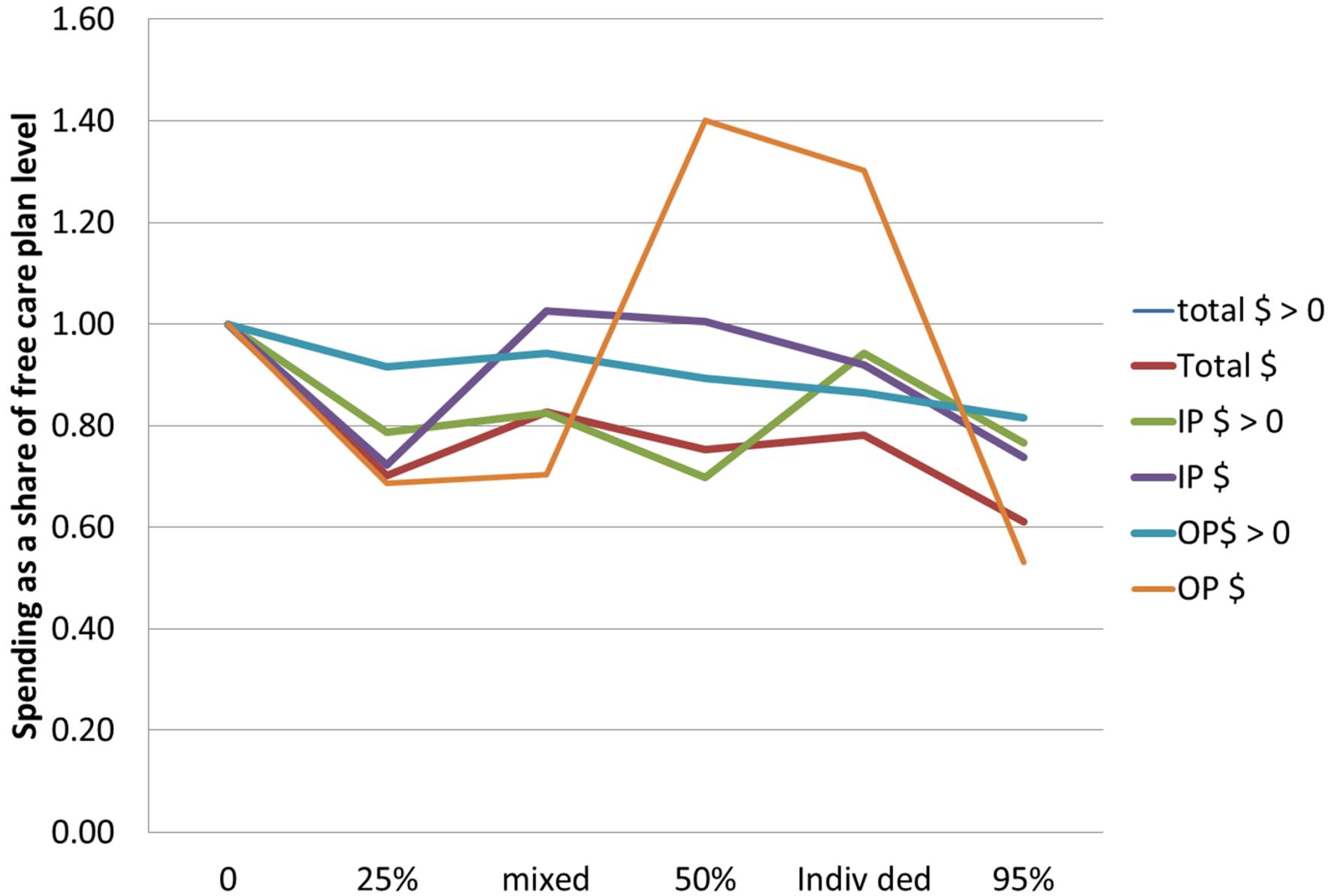


Table 3

Sensitivity of Results to Additional Covariates and Bounding Exercises

	<i>Total spending</i>			<i>Inpatient spending</i>		<i>Outpatient spending</i>		
	<i>Share with any</i> (1)	<i>Spending (in \$)</i> (2)	<i>Spending (in logs)</i> (3)	<i>Share with any</i> (4)	<i>Spending (in \$)</i> (5)	<i>Share with any</i> (6)	<i>Spending (in \$)</i> (7)	<i>Spending (in logs)</i> (8)
Panel A: 95% Coinsurance plan vs. Free Care (N = 10,564)								
(1) Baseline specification (from Table 2)	-0.170 (0.015)	-845 (119)	-1.381 (0.096)	-0.024 (0.007)	-217 (91)	-0.171 (0.016)	-629 (50)	-1.361 (0.093)
(2) Adjusted for underreporting	-0.100 (0.017)	-786 (123)	-1.313 (0.097)	-0.024 (0.007)	-217 (91)	-0.102 (0.018)	-582 (55)	-1.299 (0.095)
(3) Adjusted for underreporting + controlling for pre-randomization covariates	-0.095 (0.016)	-728 (111)	-1.276 (0.087)	-0.023 (0.007)	-183 (85)	-0.096 (0.016)	-558 (50)	-1.261 (0.084)
(4) Lee bounds + adjusted for underreporting	-0.080 (0.018)	745 (96)	-0.672 (0.098)	0.079 (0.005)	592 (71)	-0.081 (0.018)	151 (38)	-0.751 (0.095)

Table 4

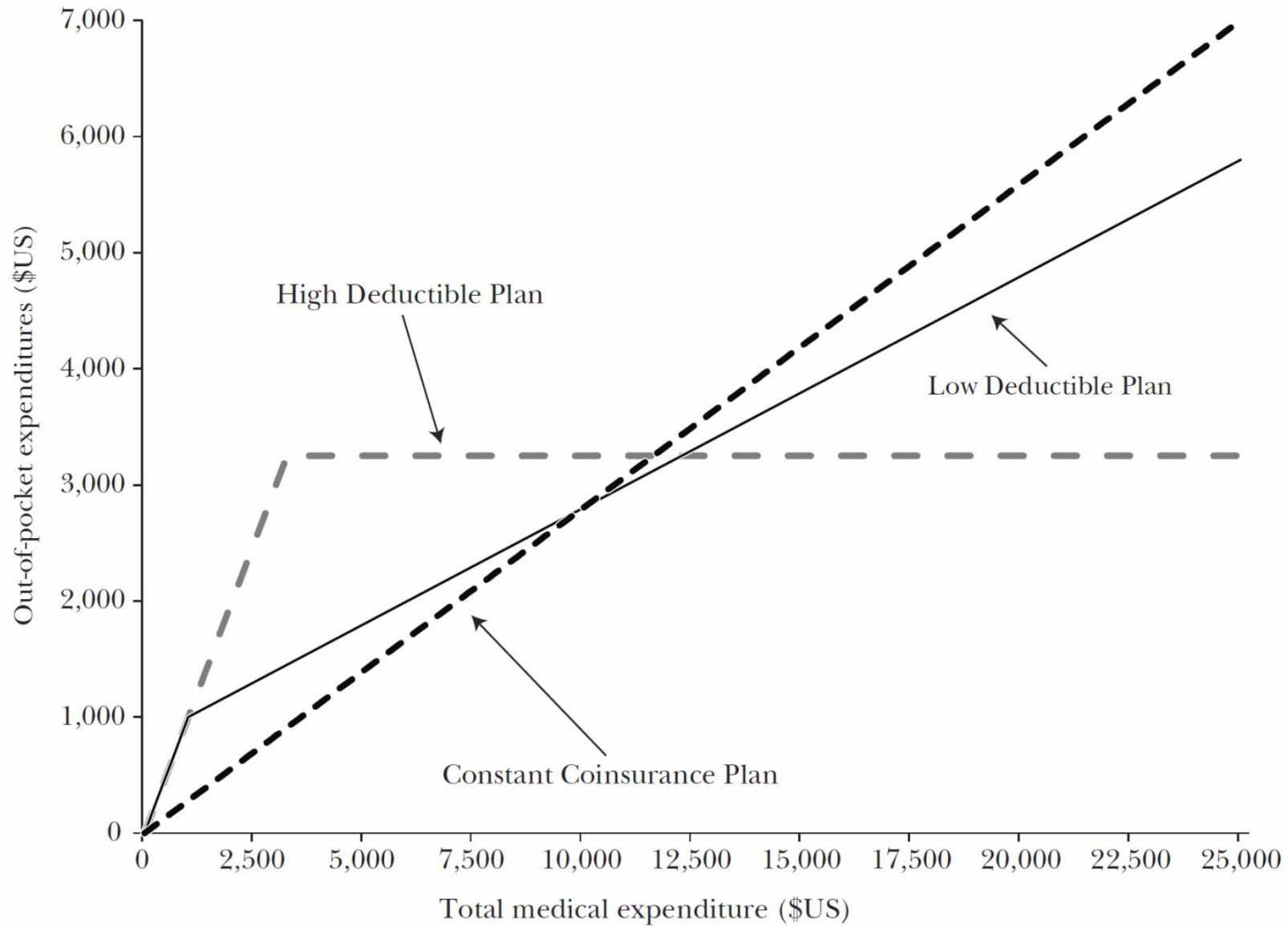
Sensitivity of Elasticity Estimates to Choice of Plan Comparisons and Price Measures

Panel A: Arc elasticities of total spending with regard to coinsurance rate, for different plan pairs^a

	<i>25%</i> <i>Coinsurance</i>	<i>Mixed</i> <i>Coinsurance^c</i>	<i>50%</i> <i>Coinsurance</i>	<i>Individual</i> <i>Deductible^c</i>	<i>95%</i> <i>Coinsurance</i>
Free Care	-0.180 (0.044)	-0.091 (0.051)	-0.149 (0.080)	-0.119 (0.031)	-0.234 (0.039)
25% Coinsurance		0.749 (0.533)	0.097 (0.281)	0.159 (0.128)	-0.097 (0.101)
Mixed Coinsurance			-0.266 (0.422)	-0.101 (0.195)	-0.295 (0.126)
50% Coinsurance				0.429 (1.176)	-0.286 (0.280)
Individual Deductible					-0.487 (0.187)

Figure 2

Nonlinear Health Insurance Coverage



Moral Hazard in Health Insurance: Developments since Arrow (1963)

Amy Finkelstein, MIT

Themes

- Arrow: “Medical insurance increases the demand for medical care.”

Finkelstein: two questions addressed:

- Is the idea of moral hazard, which is an interesting theory, empirically relevant?
- How to estimate the likely impact of alternative health insurance policies or contracts are both the level and the growth of healthcare spending?

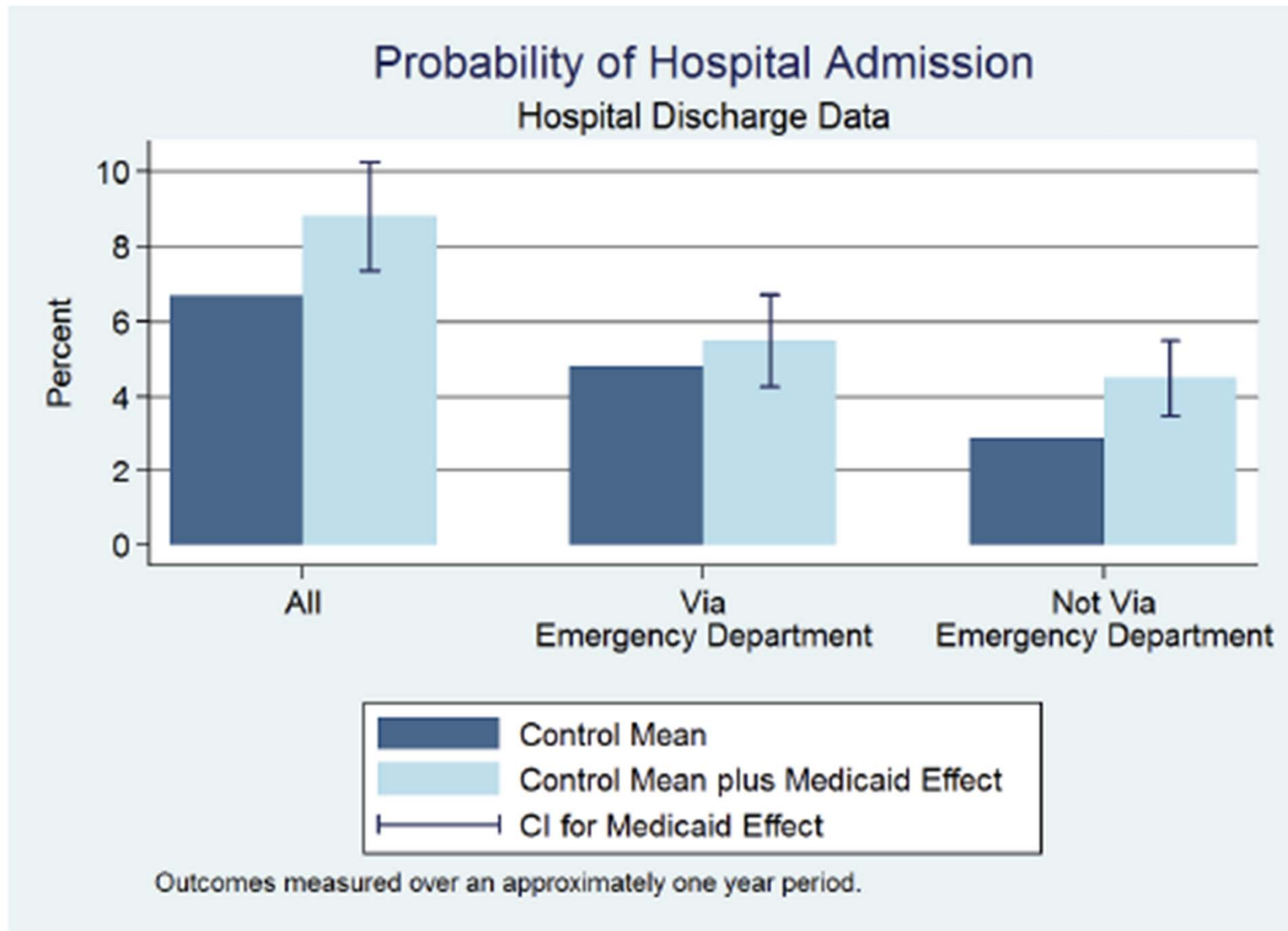
Insurance causes moral hazard (MH) problems

- *Ex ante* moral hazard: Actions that affect the probability of the state of the world (SOW) occurring (e.g. sickness) Ehrlich and Becker (1972)
- *Ex post* moral hazard: actions that affect the level of utilization conditional on a (SOW). Mark Pauly (1968)
- *Above does not distinguish demand from supply side actions. (X2)*
- Insurance also affect the type of technological change, encouraging cost increasing relative to cost decreasing innovations
- Partial equilibrium effects may differ from general equilibrium effects.
- *Insurance also changes market power of the agents, which may have even larger implications on costs.*
- *Finkelstein focuses on ex post MH*
- *Also has findings on general equilibrium effects of Medicare and thoughts on technological change*

Biggest contribution is on the Oregon Health Insurance Experiment

- Medicaid lottery conducted in Oregon in 2008
- Details at (Finkelstein et al. QJE, 2012) and also at www.nber.org/oregon
- US Medicaid has distinct programs *all state specific*
 - People with disabilities (blind, HIV, paralyzed)
 - Children
 - Seniors and dual eligibles
 - High medical cost (“medically needy”)
 - Pregnant women
 - Low income (state eligibility criteria)
- This experiment examined people eligible in the last program:
- Low income people who are financially, but not categorically eligible for Medicaid.
- income below 100% of the federal poverty line, than \$10,000 for a single person
- Uninsured but largely able - bodied
- Oregon only had money to cover 10,000 people
- 90,000 low income adults signed up
- They **randomly** drew about 30,000 names to be eligible to apply for Medicaid.
- Choice was truly random.
- They followed everyone who applied, and calculated rates based on people INVITED to apply, regardless of whether they actually enrolled in Medicaid
- Obtained enormous variety of data: surveys, credit scores, insurance claims, biometrics

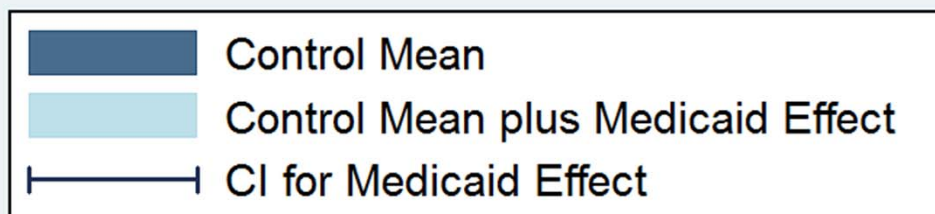
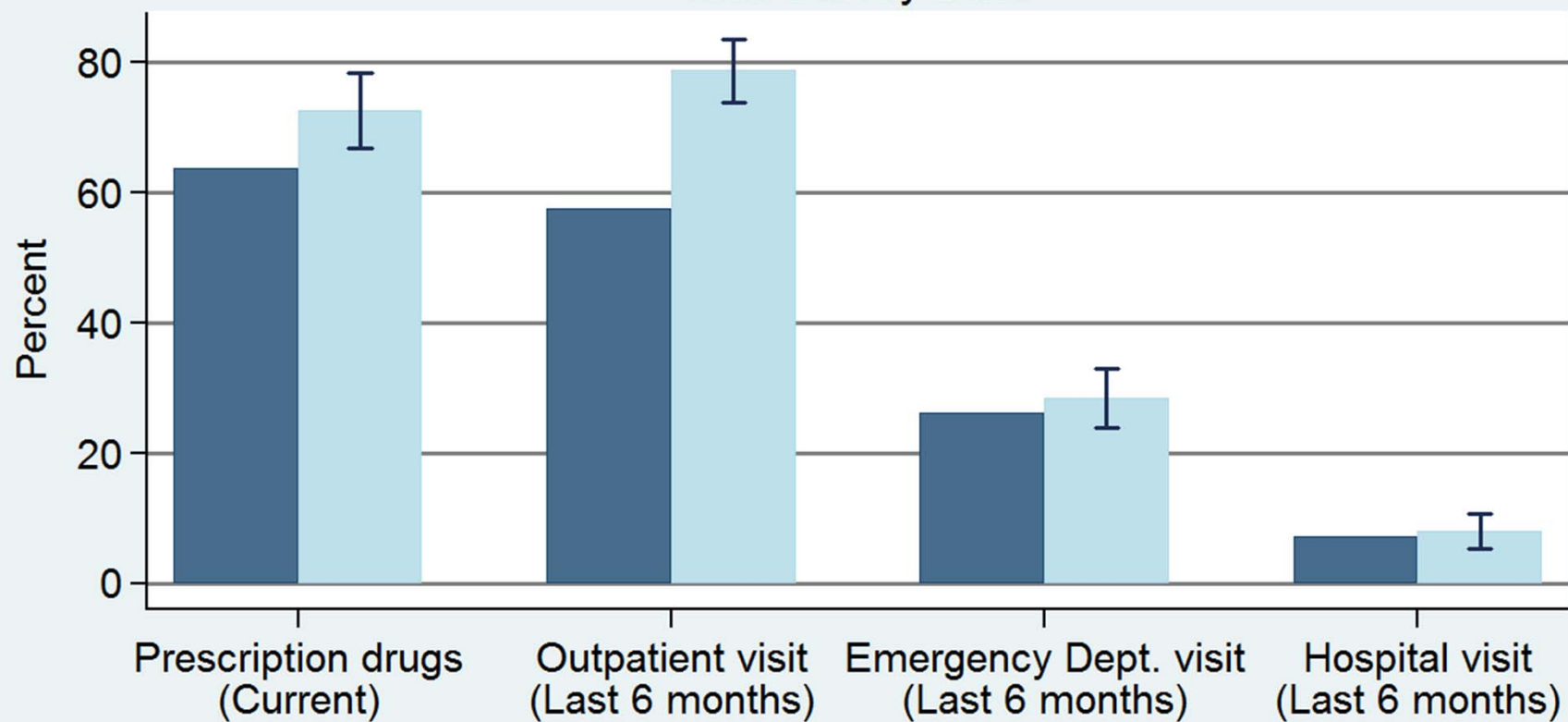
Figure 1: Impact of Medicaid on Hospital Admissions, Evidence from the Oregon Health Insurance Experiment



Source: Finkelstein et al. (2012)

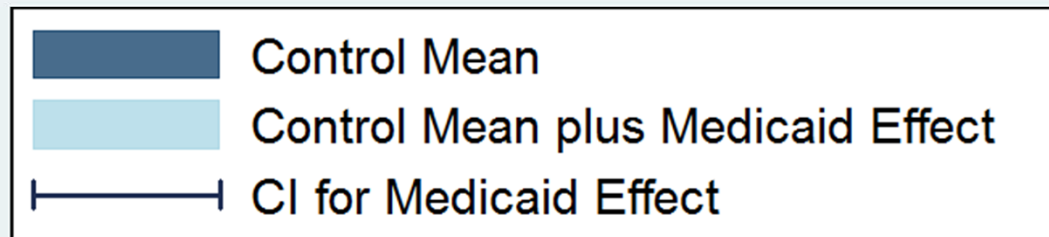
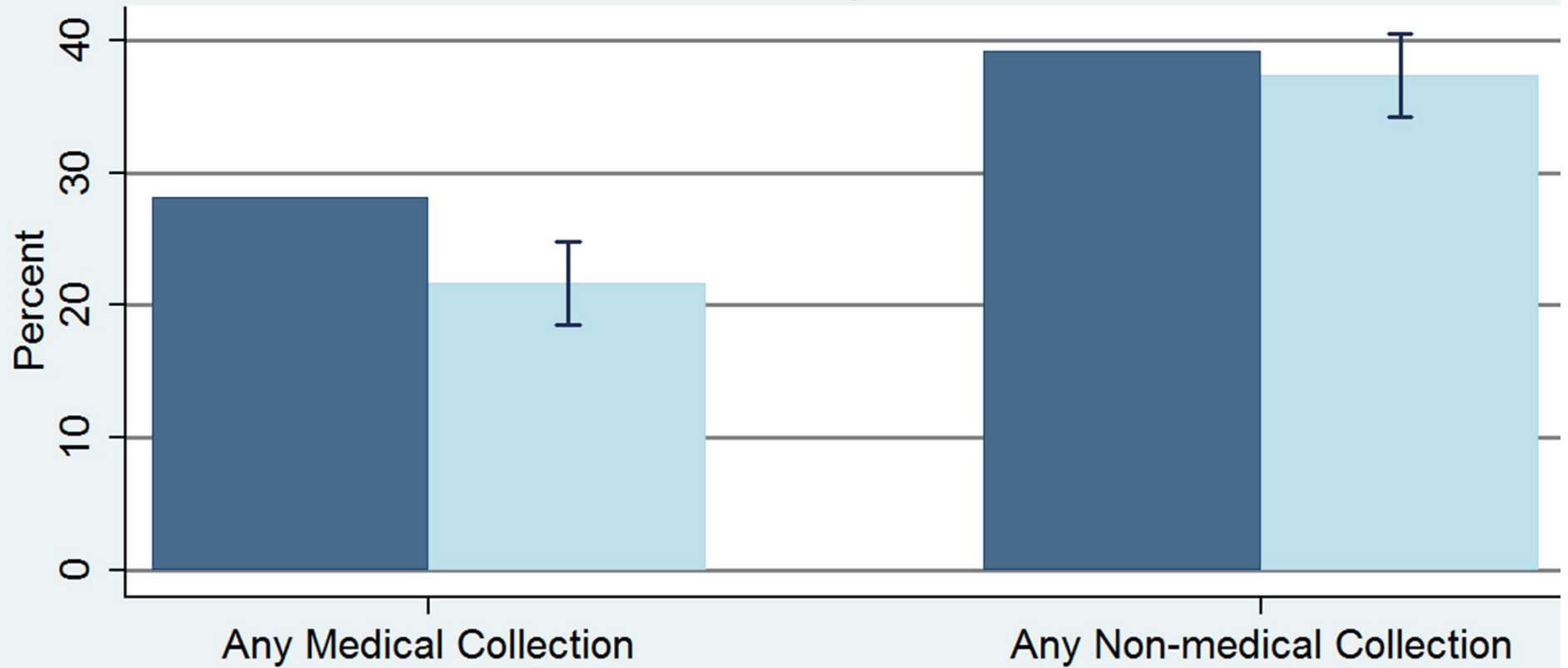
Health Care Utilization

Mail Survey Data



Medical and Non-medical Collections

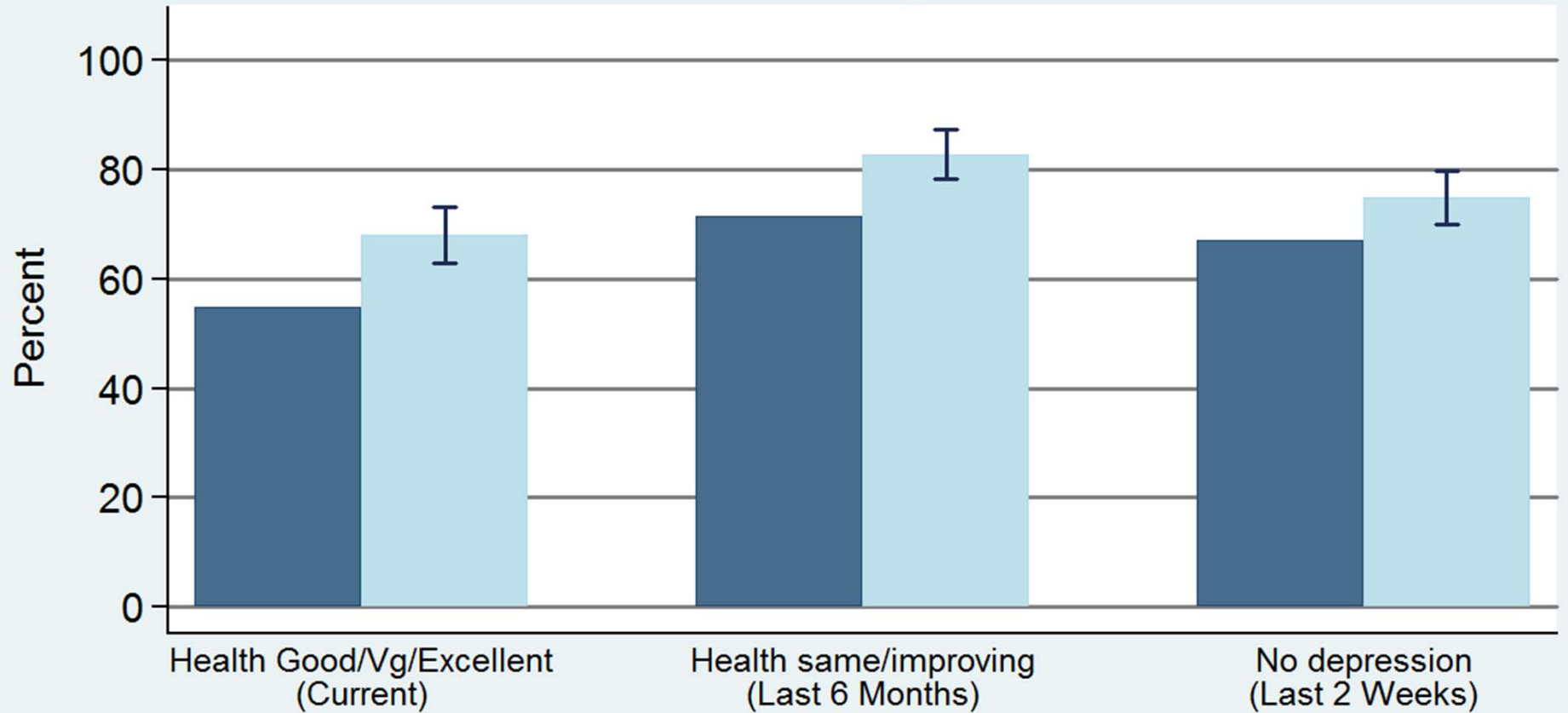
Credit Report Data



Outcomes measured over an approximately one year period.

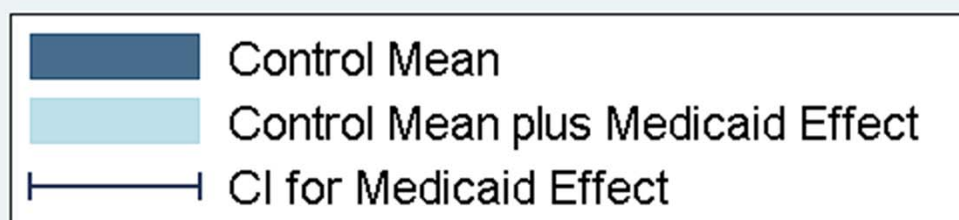
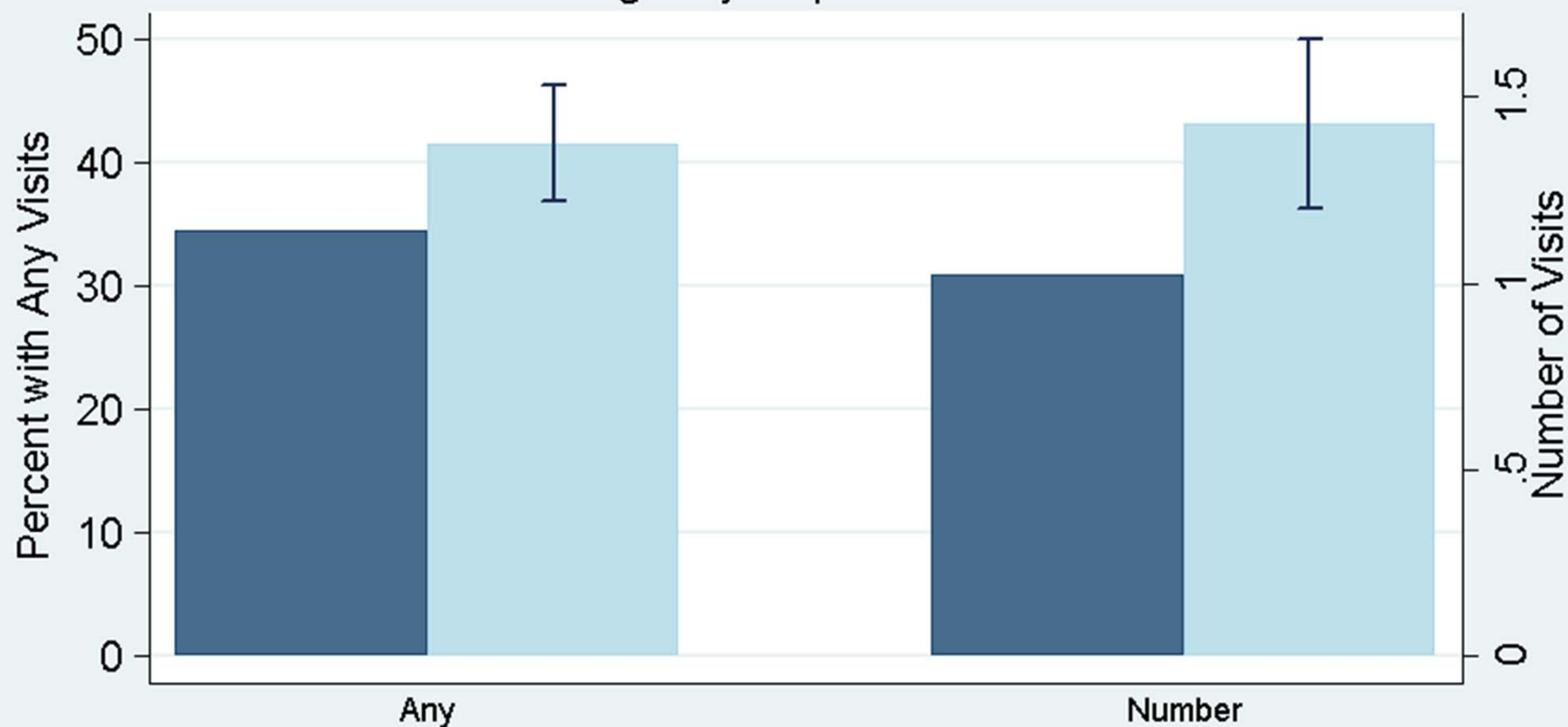
Self-reported Health

Mail Survey Data

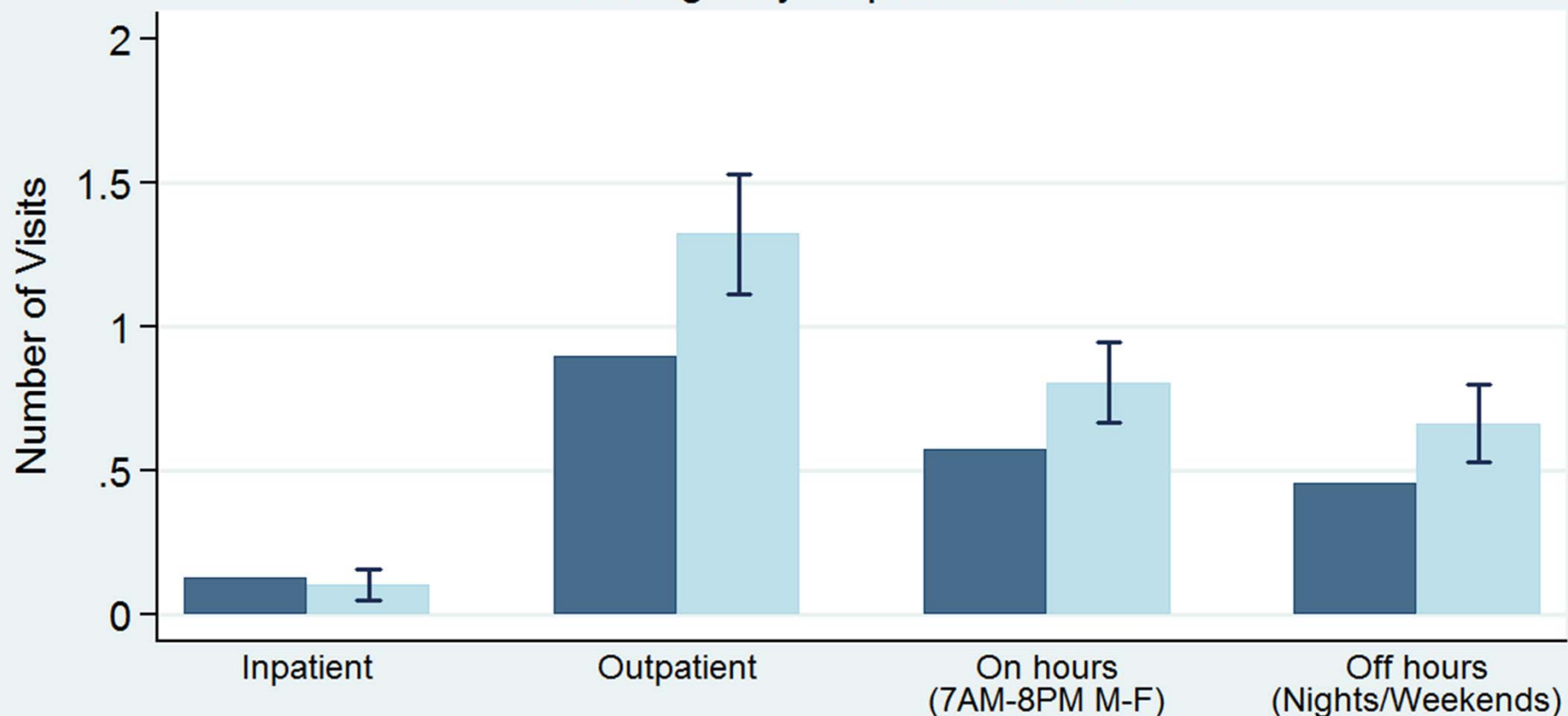


■ Control Mean
■ Control Mean plus Medicaid Effect
— CI for Medicaid Effect

Any and Total ED Use Emergency Department Data



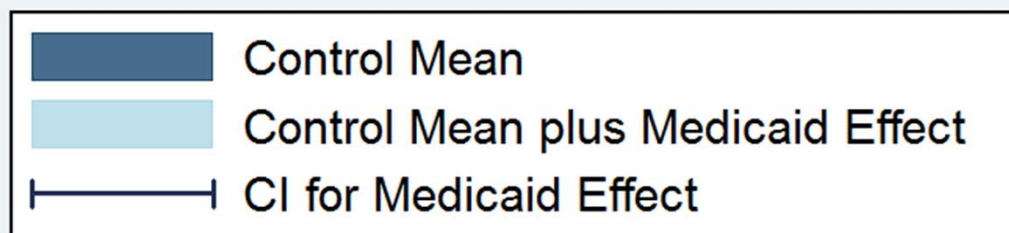
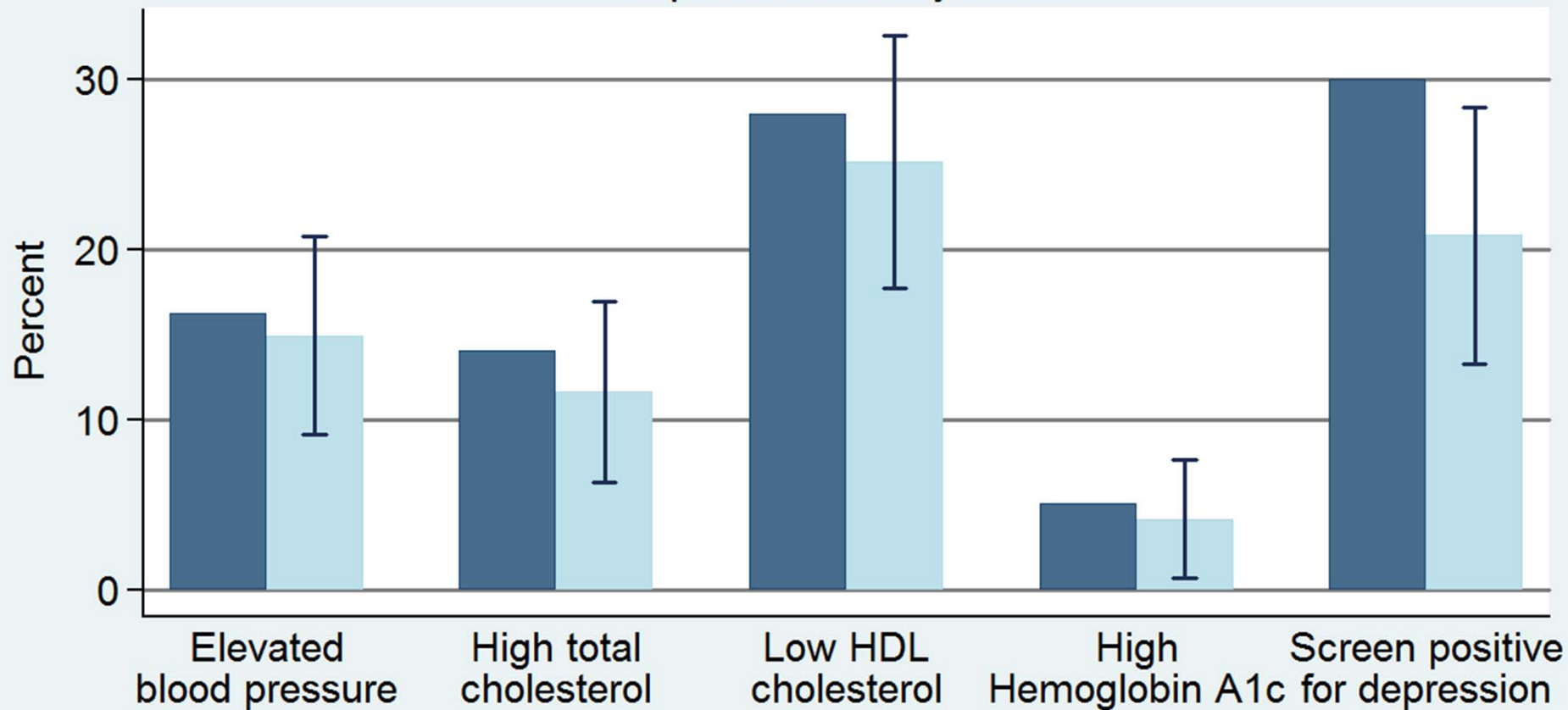
Total ED Use, by Hospitalization and Time of Day Emergency Department Data



■ Control Mean
■ Control Mean plus Medicaid Effect
— CI for Medicaid Effect

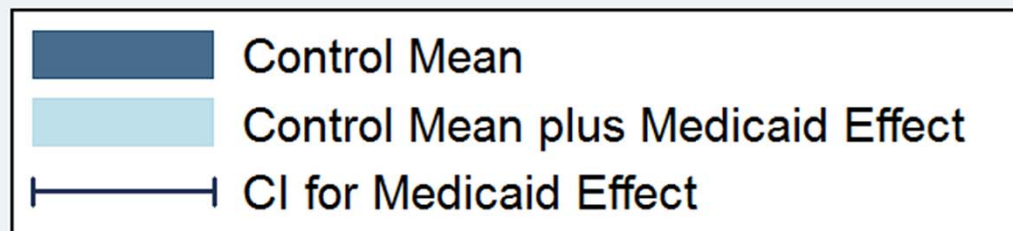
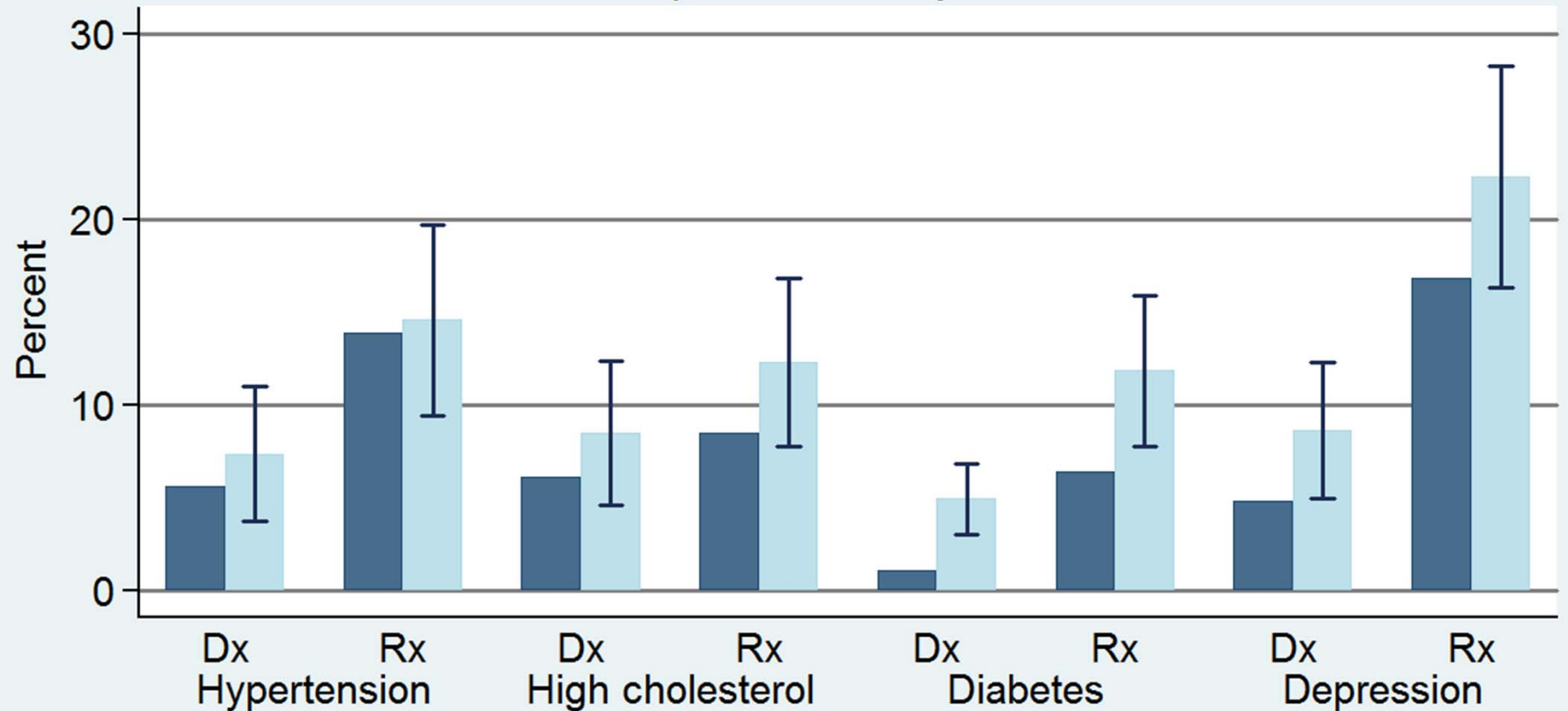
Current Clinical Measures

Inperson Survey Data



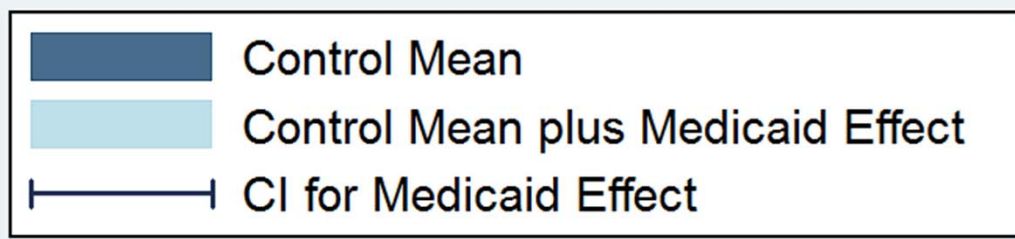
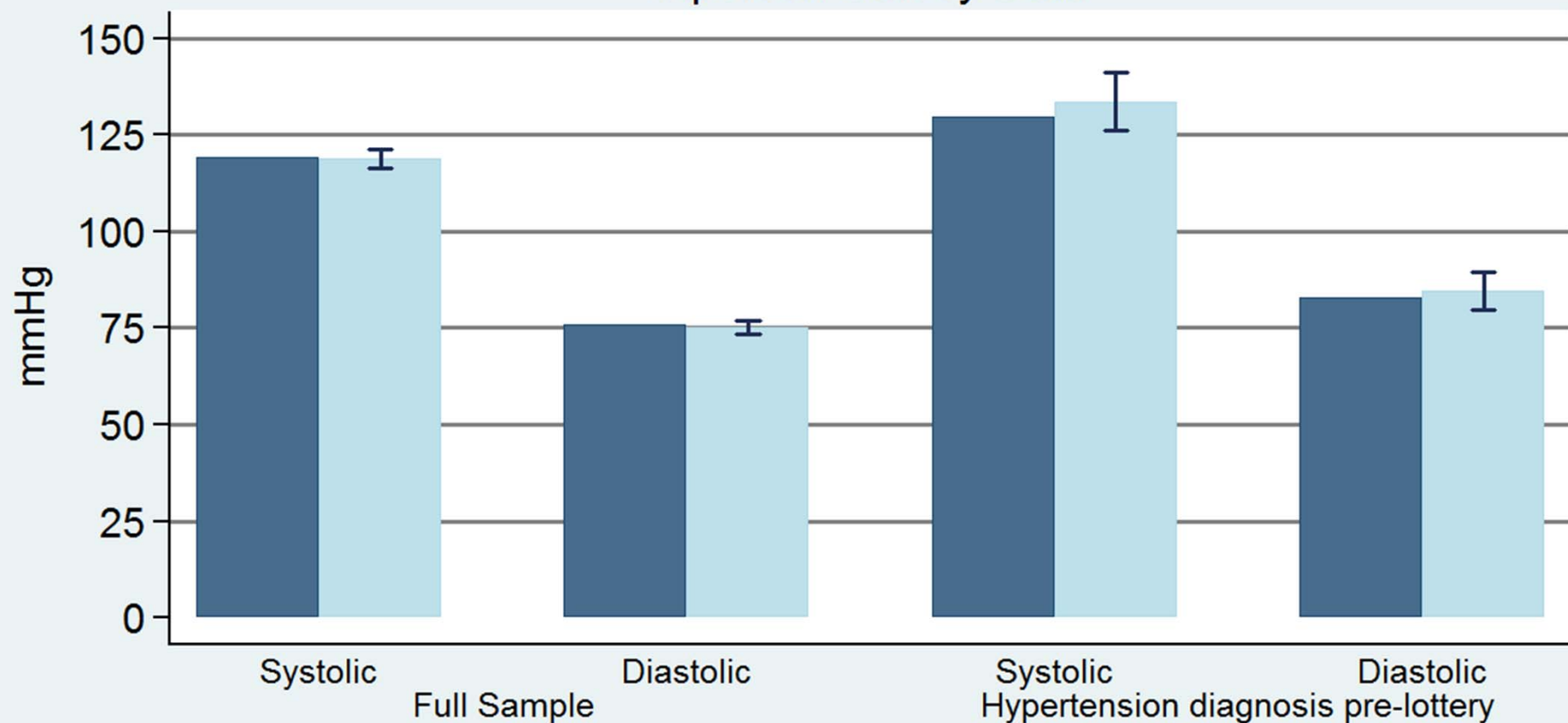
Post-lottery Diagnosis (Dx) and Current Medication (Rx)

Inperson Survey Data



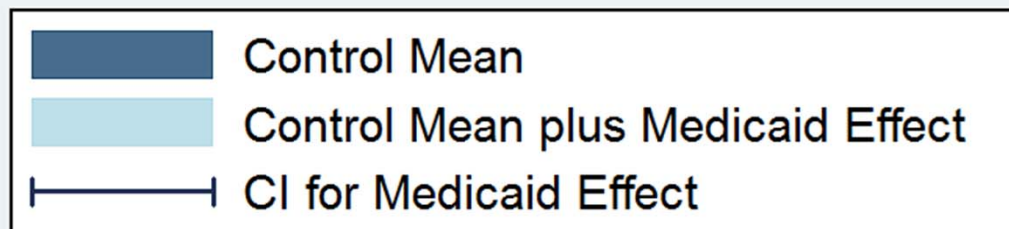
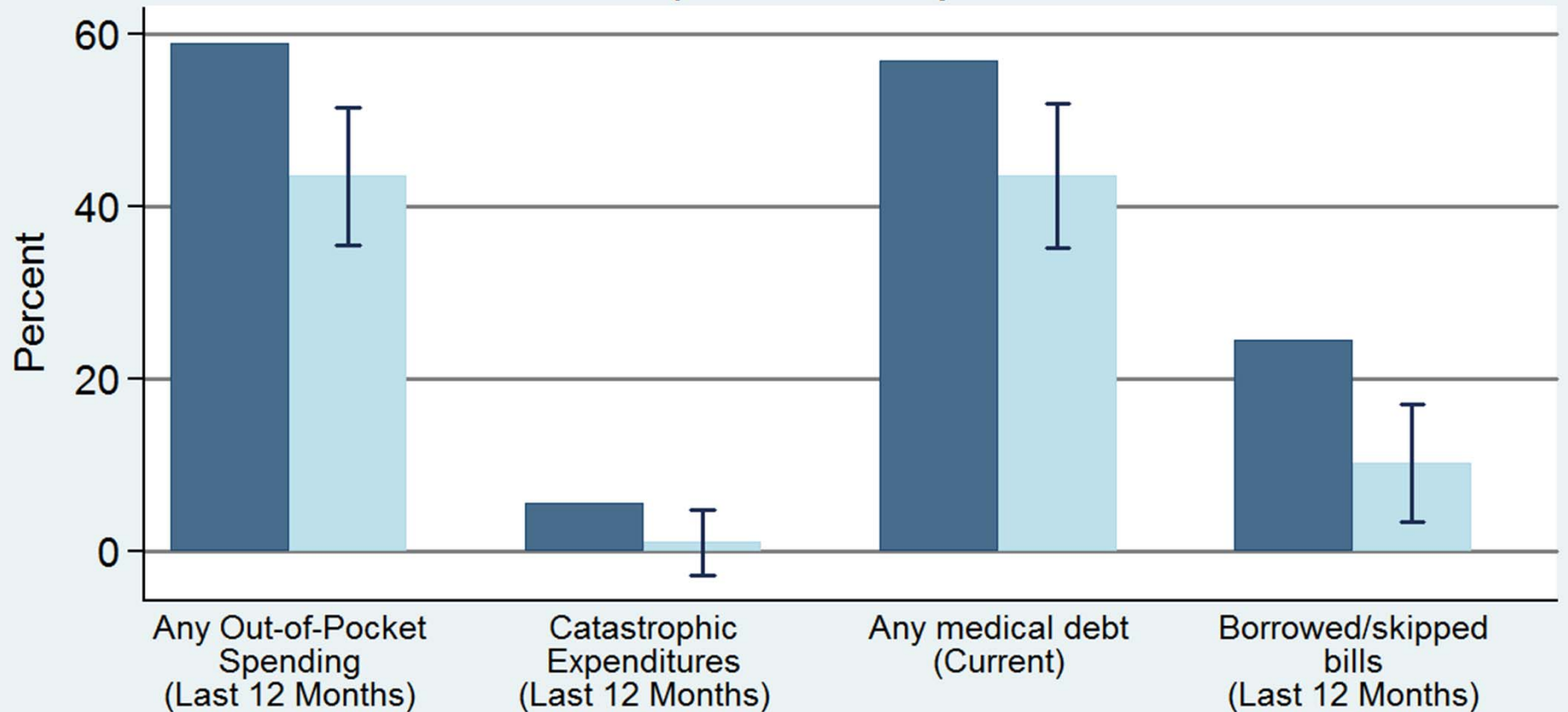
Blood Pressure

Inperson Survey Data



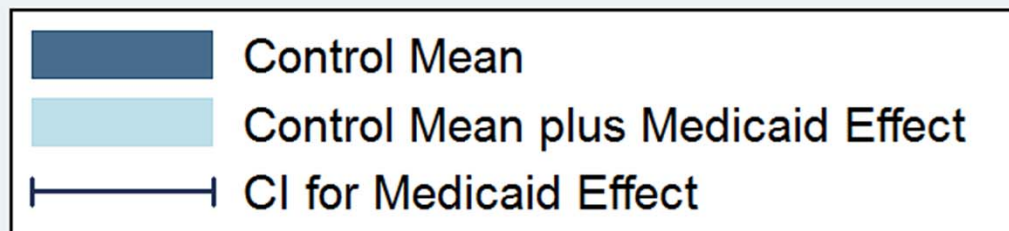
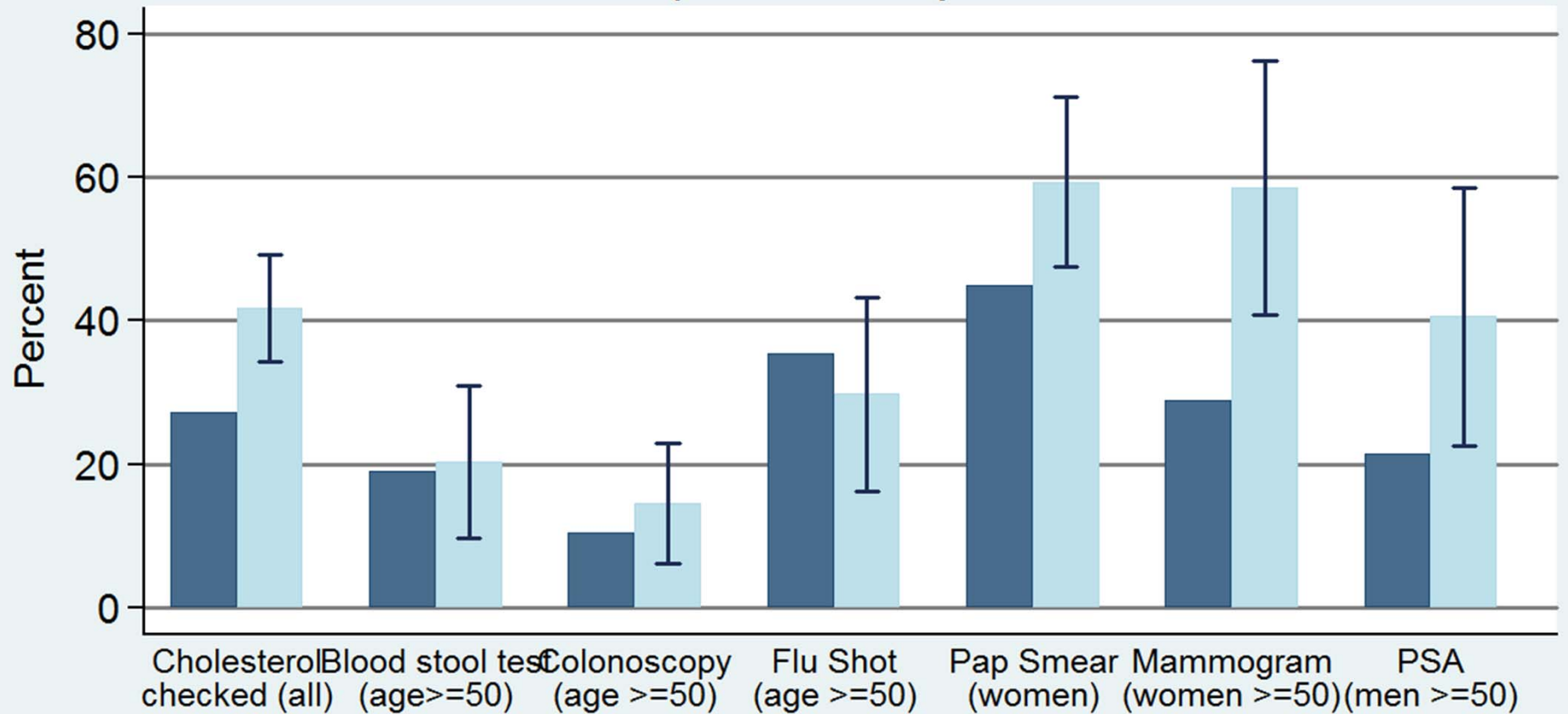
Financial Hardship

Inperson Survey Data



Preventive Care (Last 12 Months)

Inperson Survey Data



Other Oregon Medicaid results

- Medicaid increased probability of taking of prescription drugs
- probability of going to the doctor
- Medicaid increases annual medical spending by about 25% relative to those uninsured.
- This is about \$750 a year for this population
- Does not find, at least in its first year, any evidence of *ex ante* moral hazard.
- No change in smoking behavior.

Other Finkelstein (2007) results discussed

- Medicare expansion in the 1965 expanded insurance to about 7.5% of US population
- (ACA will affect about 11%)
- Her result: Medicare associated with 40% increase in hospital spending, on both elderly and young.
- Explains about half of the sixfold growth in total spending from 1950 to 1990
- Rand and Oregon partial equilibrium results on demand response can only explain about 10% of this growth

Weaknesses?

- Does not distinguish consumer from supply moral hazard
- No discussion of effects of insurance on pricing decisions by suppliers
- Technological change is a key area for further research.