Findings from the Oregon Health Insurance Experiment: Lessons for State Medicaid Expansions

Heidi Allen, Columbia

Fortuitous Timing

- What are the effects of expanding access to public health insurance for low income adults?
  - Magnitudes (and even signs) uncertain
- Limited existing evidence
  - IOM review of evidence – suggestive, but much uncertainty
  - Observational studies confounded by selection into HI
  - Quasi-experimental work often focuses on elderly and kids
  - Only one RCT in a developed country: Rand HIE
    - 1970s experiment on a general population
    - Randomized cost-sharing, not coverage itself

The Oregon Health Insurance Experiment

- Setting: OHP Standard
  - Oregon's Medicaid expansion program for poor adults
  - Eligibility
    - Poor (<100% FPL) adults 19-64
    - Not eligible for other programs
    - Uninsured>6 months
    - Legal residents, ...
  - Comprehensive coverage (no dental or vision)
  - Minimum cost-sharing
  - Similar to other states in payments, management (though changing)
  - Closed to new enrollment in 2004

The Oregon Medicaid Experiment

- Lottery
  - Waiver to operate lottery
  - 5-week sign-up period, heavy advertising (Jan-Feb 2008)
  - Low barriers to sign-up, no eligibility pre-screening
  - Limited information on list
  - Randomly drew 30,000 out of 85,000 on list (March-Oct 2008)
  - Those selected given chance to apply
    - Treatment at household level
    - Had to return application within 45 days
    - 60% applied; 50% of those deemed eligible → 10,000 enrollees

The Oregon Health Insurance Experiment

- Evaluate effects of Medicaid using lottery as RCT
  - ITT: Reduced form comparison of outcomes between treatment group (selected by lottery) and controls (not selected)
  - ToT: IV using lottery as instrument for insurance coverage
  - Massive data collection effort – primary and secondary
- Broad Questions:
  - Costs: Health care utilization
  - Benefits I: Financial risk exposure
  - Benefits II: Health

Data

- Pre-randomization demographic information
  - From lottery sign-up
- State administrative records on Medicaid enrollment
  - Primary measure of first stage (insurance coverage)
- Outcomes
  - Administrative data (~16 months post-notification)
    - Hospital discharge data, mortality, credit reports
  - Mail surveys (~15 months)
    - Some questions ask 6-month look-back, some current
  - In-person survey and measurements (~25 months)
    - Detailed questionnaires, blood samples, BP, BMI

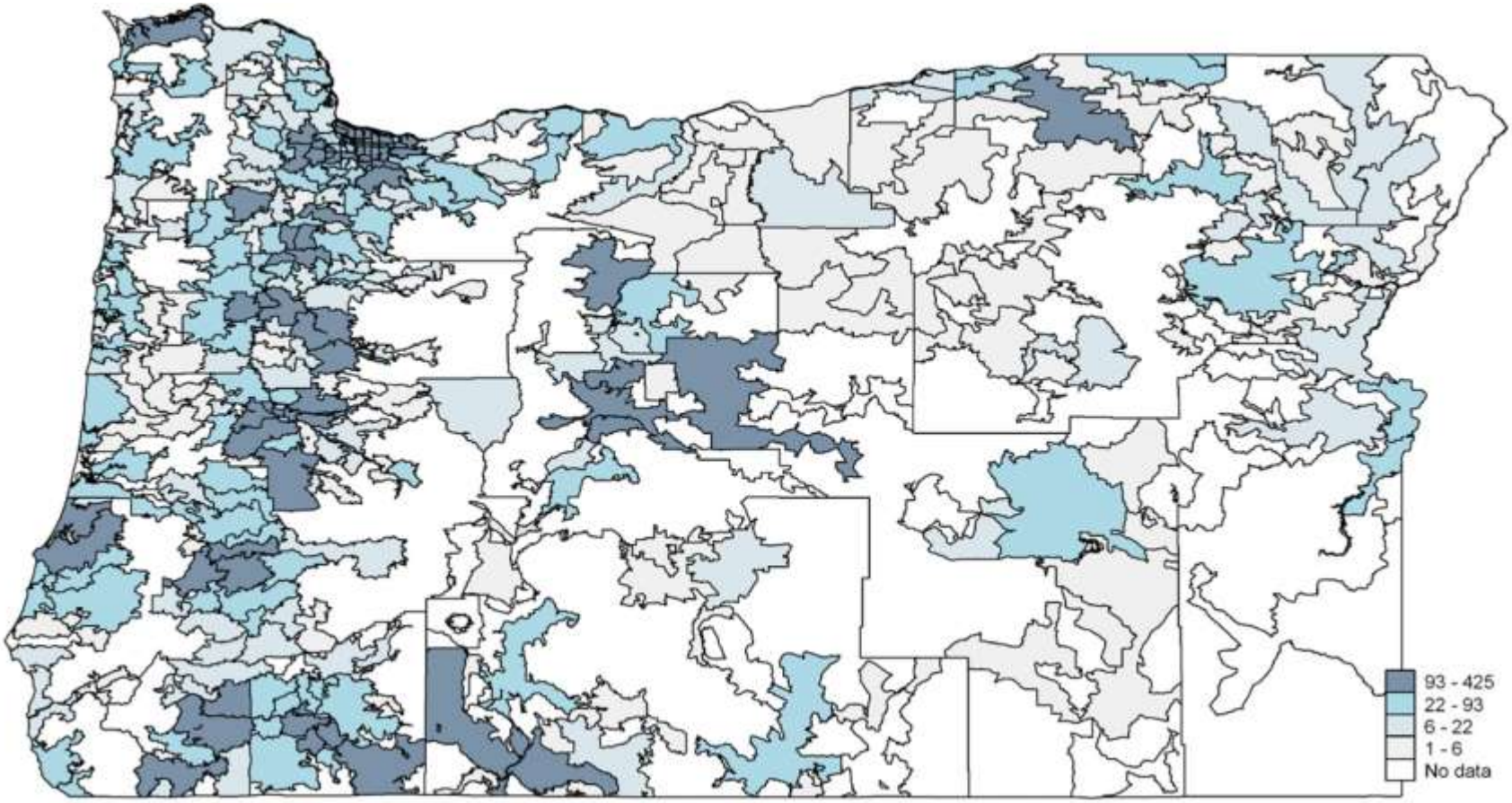
Sample

- 89,824 unique individuals on the list
- Sample exclusions (based on pre-randomization data ONLY)
  - Ineligible for OHP Standard (out of state address, age, etc)
  - Individuals with institutional addresses on list
- Lottery list only pre-randomization non-admin data
- Final sample: 74,922 individuals (66,385 households)
  - 29,834 treated individuals (surveyed 29,589)
  - 45,088 control individuals (surveyed 28,816)

Study Population

Lottery List

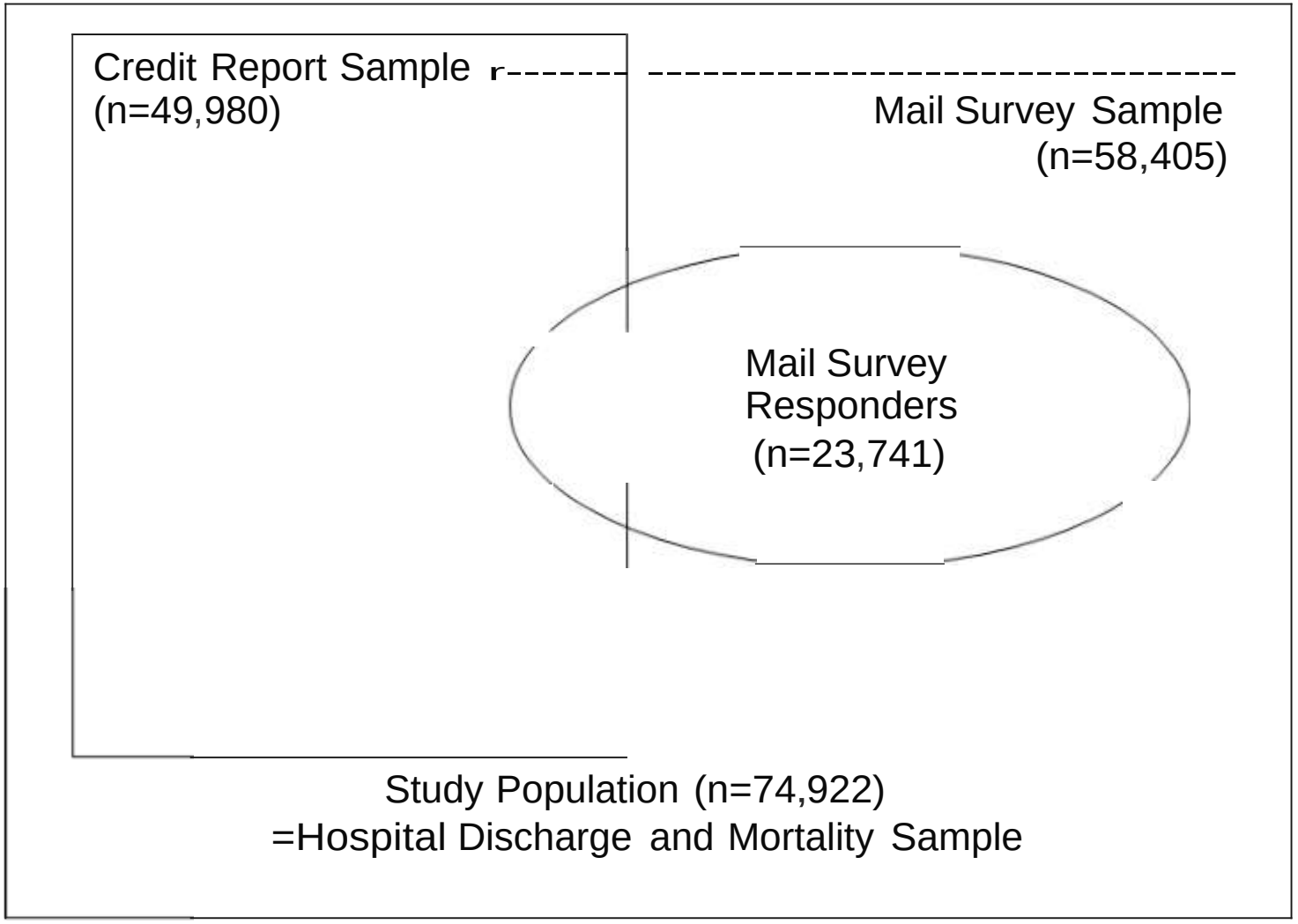
Distribution Across Zip Codes



Sample Characteristics

Variable	Mean	Variable	Mean
Panel A: Full sample			
%Female	0.56	Average Age	41
Panel B: Survey responders only			
Demographics:		*Health Status: Ever diagnosed with:*	
%White	0.82	Diabetes	0.18
%Black	0.04	Asthma	0.28
% Spanish/Hispanic/Latino	0.12	High Blood Pressure	0.40
% High school or less	0.67	Emphysema or Chronic Bronchitis	0.13
%don't currently work	0.55	Depression	0.56
Determinants of eligibility:			
Average hh income (2008)	13,050	%with any insurance	0.33
% below Federal poverty line	0.68	%with private insurance	0.13

Study Population



Closer Look: Administrative Data

- **Medicaid records**
  - Pre-randomization demographics from list
  - Enrollment records to assess "first stage" (how many of the selected got insurance coverage)
- **Hospital Discharge Data 2007-2010**
  - Probabilistically matched to list, de-identified at OHPR
  - Includes dates and source of admissions, diagnoses, procedures, length of stay, hospital identifier
  - Includes years before and after randomization
- **Other Data 2007-2010**
  - Mortality data from Oregon death records
  - Credit report data, probabilistically matched, de-identified

Closer Look: Mail Survey Data

- **Fielding Protocol**
  - ~70,000 people, surveyed at baseline & 12 months later
  - Basic protocol: Three-stage mail survey protocol, English/Spanish
  - Intensive protocol on a 30% subsample included additional tracking, mailings, phone attempts
    - Done to adjust for non-response bias
- **Response Rate**
  - Effective response rate=50%
  - Non-response bias always possible, but response rate and pre-randomization measures in admin data were balanced between treatment & control

Closer Look: In-Person Data Collection

Questionnaire and health examination including

- Survey questions
- Anthropometric and blood pressure measurement
- Dried blood spot collection
- Catalog of all medications

- Fielded between September 2009 and December 2010
  - Average response ~25 months after lottery began
- Limited to Portland area: 20,745-person sample
- 12,229 interviews for effective response rate of 73%

Empirical Framework

- Reduced form – effect of lottery selection

$$y_{ihj} = \beta_0 + \beta_1 LOTTERY_h + X_{ih}\beta_2 + V_{ih}\beta_3 + \varepsilon_{ihj}$$

  - Validity of experimental design: real randomization; balance on T and C (especially surveys)

- IV – effect of insurance coverage

$$INSURANCE_{ihj} = \delta_0 + \delta_1 LOTTERY_{ih} + X_{ih}\delta_2 + V_{ih}\delta_3 + \mu_{ihj}$$
$$y_{ihj} = \pi_0 + \pi_1 INSURANCE_{ih} + X_{ih}\pi_2 + V_{ih}\pi_3 + \nu_{ihj}$$

  - Effect of lottery on coverage: about 25 percentage points
  - Additional assumption for causality: primary pathway
    - Could affect participation in other programs, but actually small
    - "Warm glow" of winning – especially early

- Analysis plan, multiple inference adjustment

Effects of Lottery on Coverage (1st Stage)

	Full sample		Credit subsample		Survey respondents	
	Control mean	Estimated FS	Control mean	Estimated FS	Control mean	Estimated FS
Ever on Medicaid	0.141	0.256 (0.004)	0.135	0.255 (0.004)	0.135	0.290 (0.007)
Ever on OHP Standard	0.027	0.264 (0.003)	0.028	0.264 (0.004)	0.026	0.302 (0.005)
#of Months on Medicaid	1.408	3.355 (0.045)	1.352	3.366 (0.055)	1.509	3.943 -0.09
On Medicaid, end of study period	0.106	0.148 (0.003)	0.101	0.151 (0.004)	0.105	0.189 (0.006)
Currently have any insurance (self report)					0.325	0.179 (0.008)
Currenty have private ins. (self report)					0.128	-0.008 (0.005)
Currently on Medicaid (self report)					0.117	0.197 (0.006)
Currently on Medicaid					0.093	0.177 (0.006)

Outcomes

- **Access & Use of Care**
  - Is access to care improved? Do the insured use more care? Is there a shift in the types of care being used?
  - Mail surveys and hospital discharge data
- **Financial Strain**
  - How much does insurance protect against financial strain? What are the out-of-pocket cost implications?
  - Mail surveys and credit reports
- **Health**
  - What are the short-term impacts on physical & mental health?
    - Mail surveys (self-report)
    - In-person health screenings (self-report +biomarkers)
    - Vital statistics (mortality)

Results: Access & Use of Care

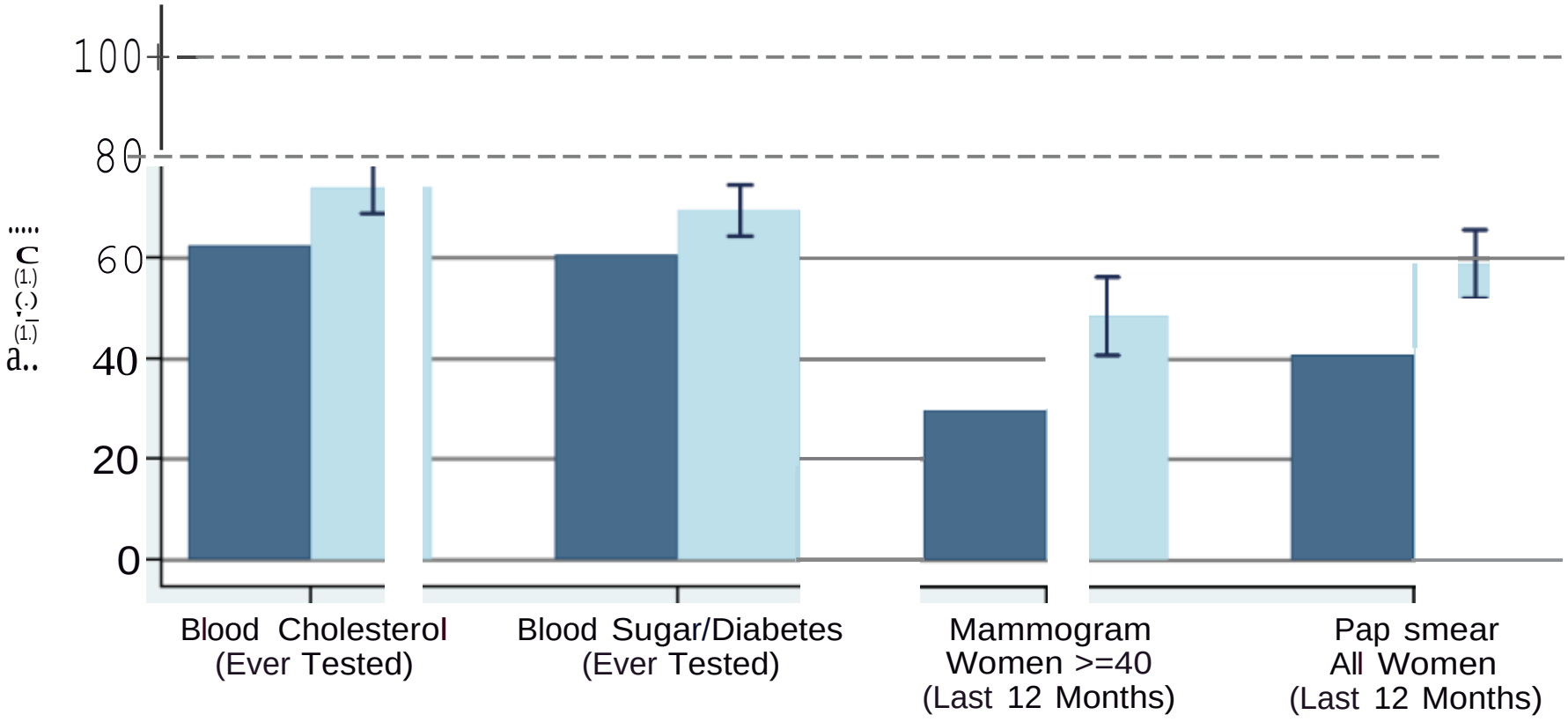
Gaining insurance resulted in better access to care and higher satisfaction with care (conditional on actually getting care).

	CONTROL	RF Model (ITT)	IV Model (ToT)	P-Value
Have a usual place of care	49.9%	+9.9%	+33.9%	.0001
Have a personal doctor	49.0%	+8.1%	+28.0%	.0001
Got all needed health care	68.4%	+6.9%	+23.9%	.0001
Got all needed prescriptions	76.5%	+5.6%	+19.5%	.0001
Satisfied with quality of care	70.8%	+4.3%	+14.2%	.001

SOURCE: Mail Survey Data

Preventive Care

Mail Survey Data



Results: Access & Use of Care

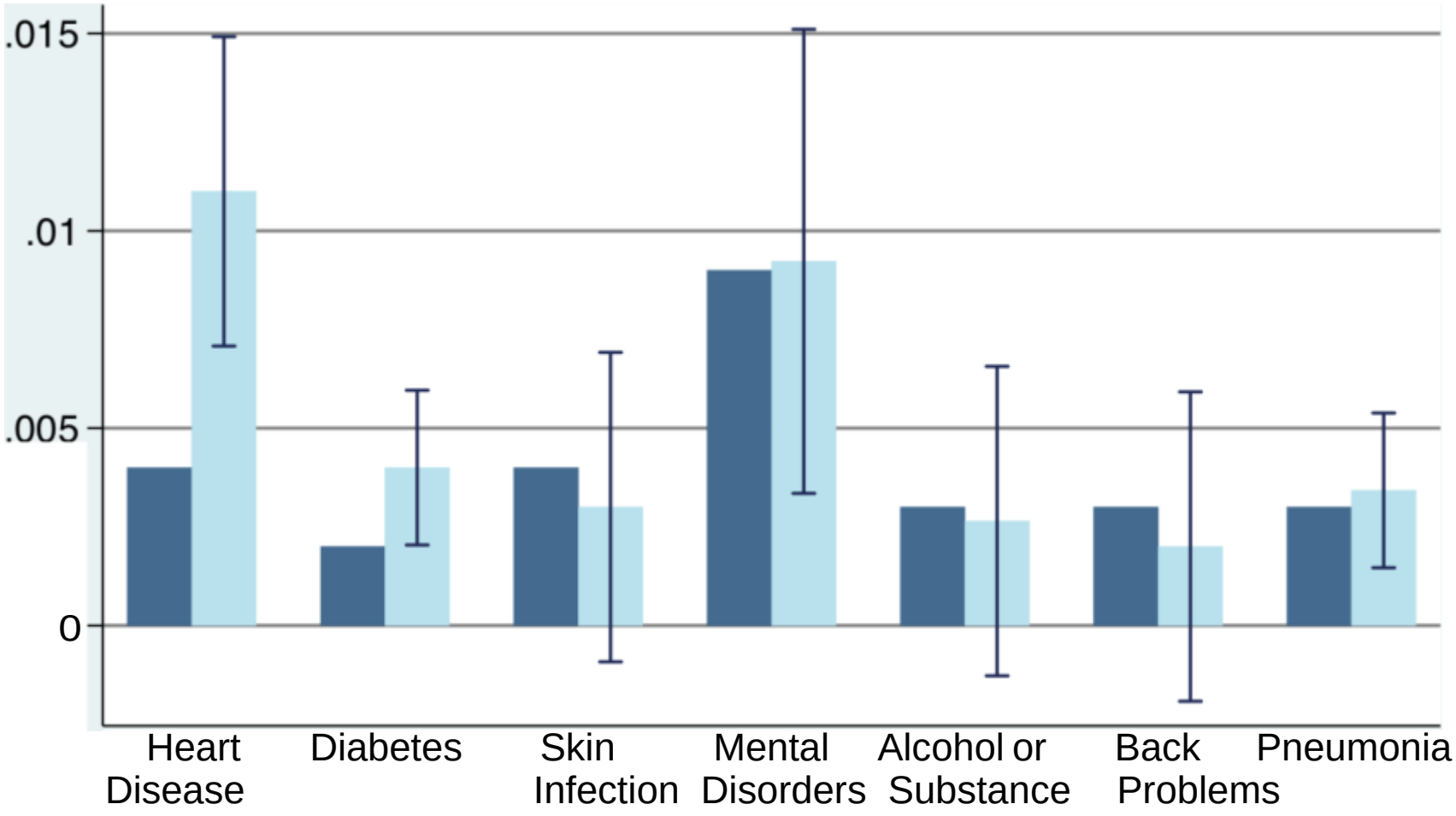
Gaining insurance resulted in increased probability of hospital admissions, primarily driven by non-ED admissions.

	CONTROL	RF Model (ITT)	IV Model (ToT)	P-Value
Any hospital admission	6.7%	+.50%	+2.1%	.004
--Admits through ED	4.8%	+.2%	+.7%	.265
--Admits NOT through ED	2.9%	+.4%	+1.6%	.002

SOURCE: Hospital Discharge Data

Overall, this represents a 30% higher probability of admission, although admissions are still rare events.

Hospital Utilization for Selected Conditions



Summary: Access & Use of Care

Overall, utilization and costs went up. *Relative to controls*….

- 30% increase in probability of an inpatient admission
- 35% increase in probability of an outpatient visit
- 15% increase in probability of taking prescription medications
- Total $777 increase in average spending (a 25% increase)

With this spending, those who gained insurance were….

- 35% more likely to get all needed care
- 25% more likely to get all needed medications
- Far more likely to follow preventive care guidelines, such as mammograms (60%) and PAP tests (45%)

Results: Financial Strain

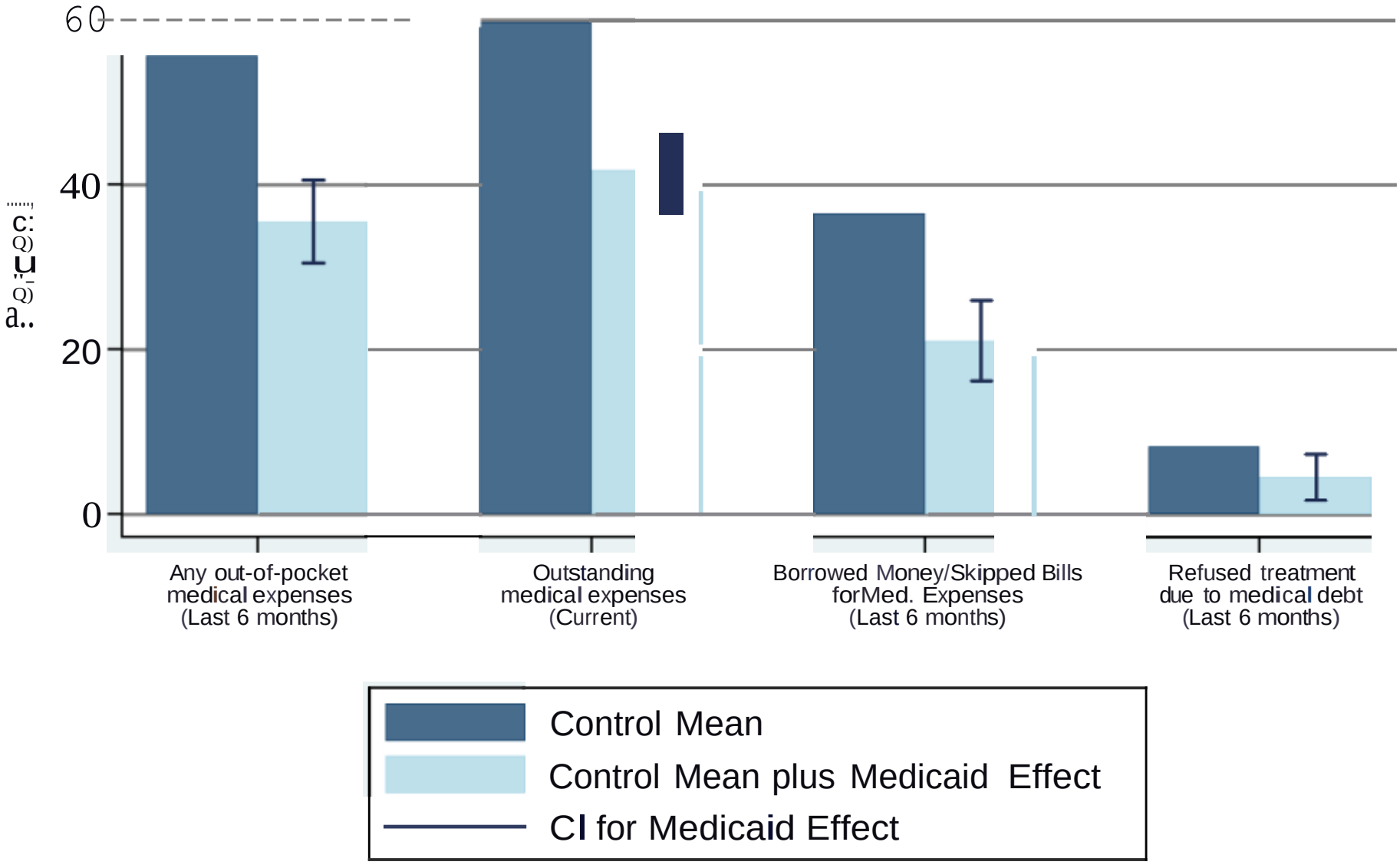
Gaining insurance resulted in a reduced probability of having medical collections in credit reports, and in lower amounts owed.

	CONTROL	RF Model (ITT)	IV Model (ToT)	P-Value
Had a bankruptcy	1.4%	+0.2%	+0.9%	.358
Had a collection	50.0%	-1.2%	-4.8%	.013
--Medical collections	28.1%	-1.6%	-6.4%	.0001
--Non-medical collections	39.2%	-0.5	-1.8%	.455
$ owed medical collections	$1,999	-$99	-$390	.025

SOURCE: Credit report data

Self-reported Financial Strain

Mail Survey Data



Summary: Financial Strain

Overall, reductions in collections on credit reports were evident

- 25% decrease in probability of a medical collection
- Those with a collection owed significantly less

Household financial strain related to medical costs was mitigated

- Substantial reduction across all financial strain measures
- Captures "informal channels" people use to make it work

Implications for both patients and providers

- Only 2% of bills sent to collections are ever paid

Results: Self-Reported Health

Self-reported measures showed significant improvements one year after randomization

	CONTROL	RF Model (ITT)	IV Model (ToT)	P-Value
Health good, v good, excellent	54.8%	+3.9%	+13.3%	.0001
Health stable or improving	71.4%	+3.3%	+11.3%	.0001
Depression screen NEGATIVE	67.1%	+2.3%	+7.8%	.003
CDC Healthy Days (physical)	21.86	+.381	+1.31	.018
CDC Healthy Days (mental)	18.73	+.603	+2.08	.003

SOURCE: Mail Survey Data

Summary: Self-Reported Health

Overall, big improvements in self-reported physical & mental health

- 25% increase in probability of good, very good, or excellent health
- 10% decrease in probability of screening for depression

Physical health measures open to several interpretations

- Improvements consistent with findings of increased utilization, better access, and improved quality
- BUT in our "baseline" surveys, results appeared shortly after coverage (~2/3rds magnitude of full results)
- May suggest increase in perception of well being rather than phys health

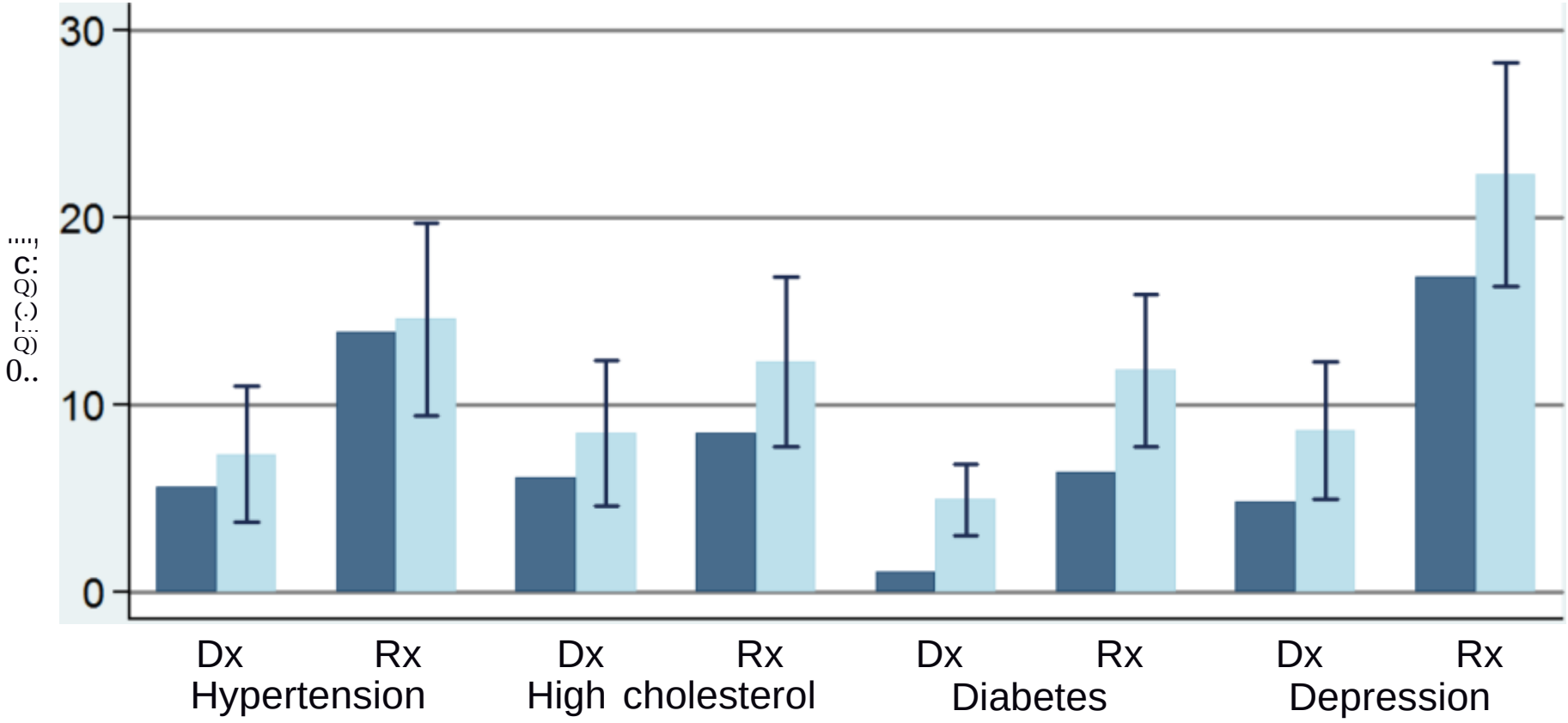
Biomarker data can shed light on this issue

Focusing on specific conditions

- Measured:
  - blood pressure
  - cholesterol levels
  - glycated hemoglobin
  - depression
- Reasons for selecting these:
  - Reasonably prevalent conditions
  - Clinically effective medications exist
  - Markers of longer term risk of cardiovascular disease
  - Can be measured by trained interviewers and lab tests
- A limited window into health status

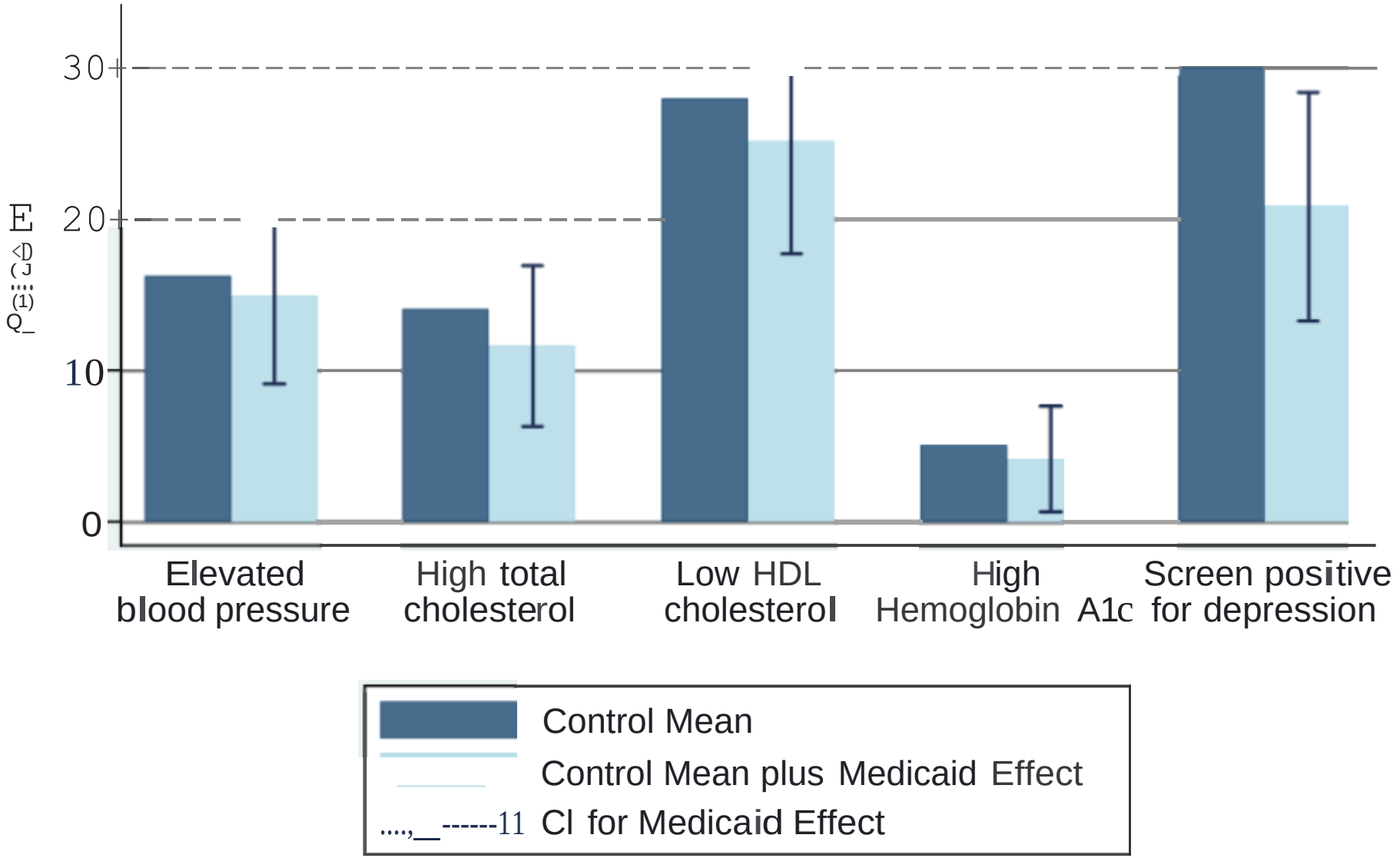
Post-lottery Diagnosis (Dx) and Current Medication (Rx)

Inperson Survey Data



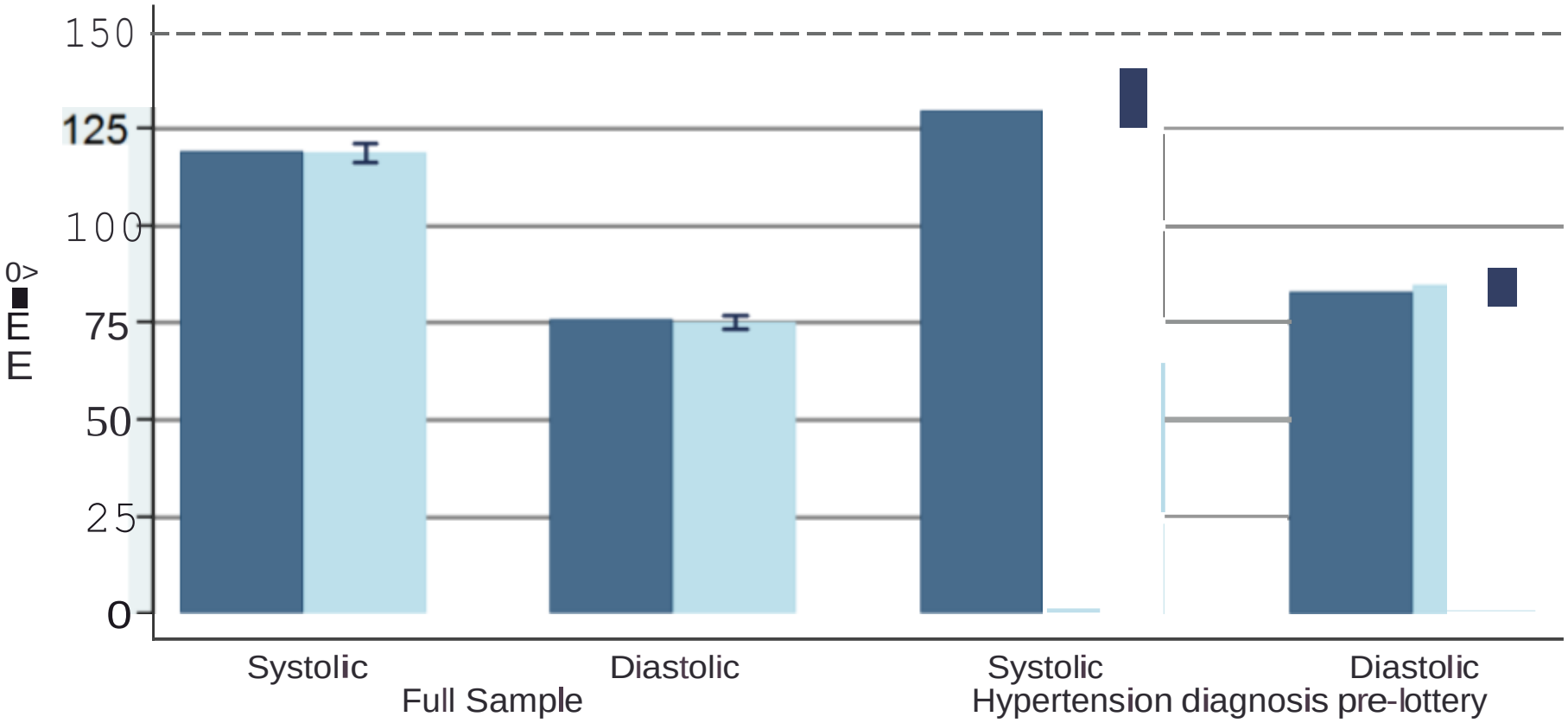
Current Clinical Measures

Inperson Survey Data



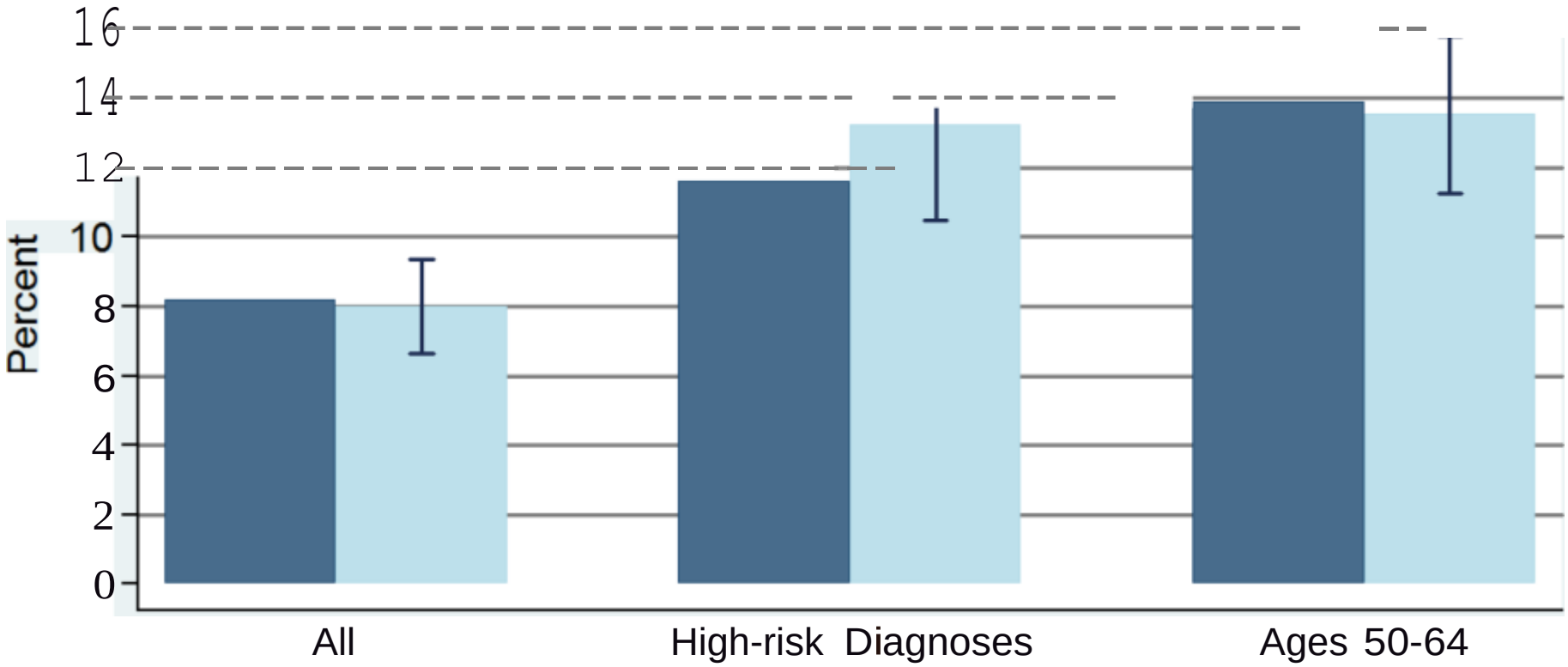
Blood Pressure

Inperson Survey Data



Framingham Risk Scores

Inperson Survey Data



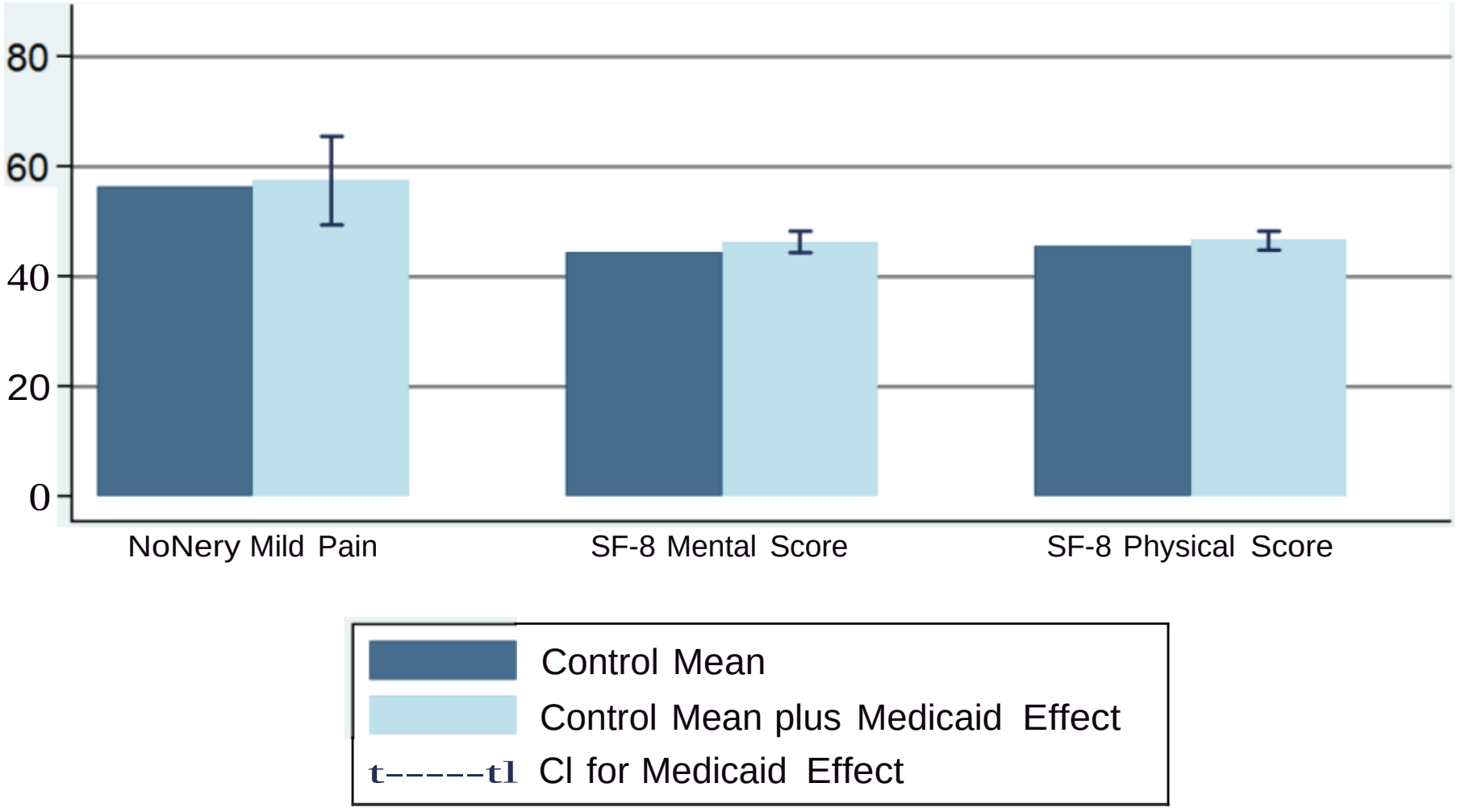
Framingham Risk Score gives the 10 year predicted risk of cardiovascular disease.

Results on specific conditions

- Large reductions in depression
  - Increases in diagnosis and medication
  - In-person estimate of -9 percentage points in being depressed
- Glycated hemoglobin
  - Increases in diagnosis and medication
  - No significant effects on HbA1c; wide confidence intervals
- Blood pressure and cholesterol
  - No significant effects on diagnosis or medication
  - No significant effects on outcomes
- Framingham risk score
  - No significant effect (in general or sub-populations)

Health-Related Quality of Life

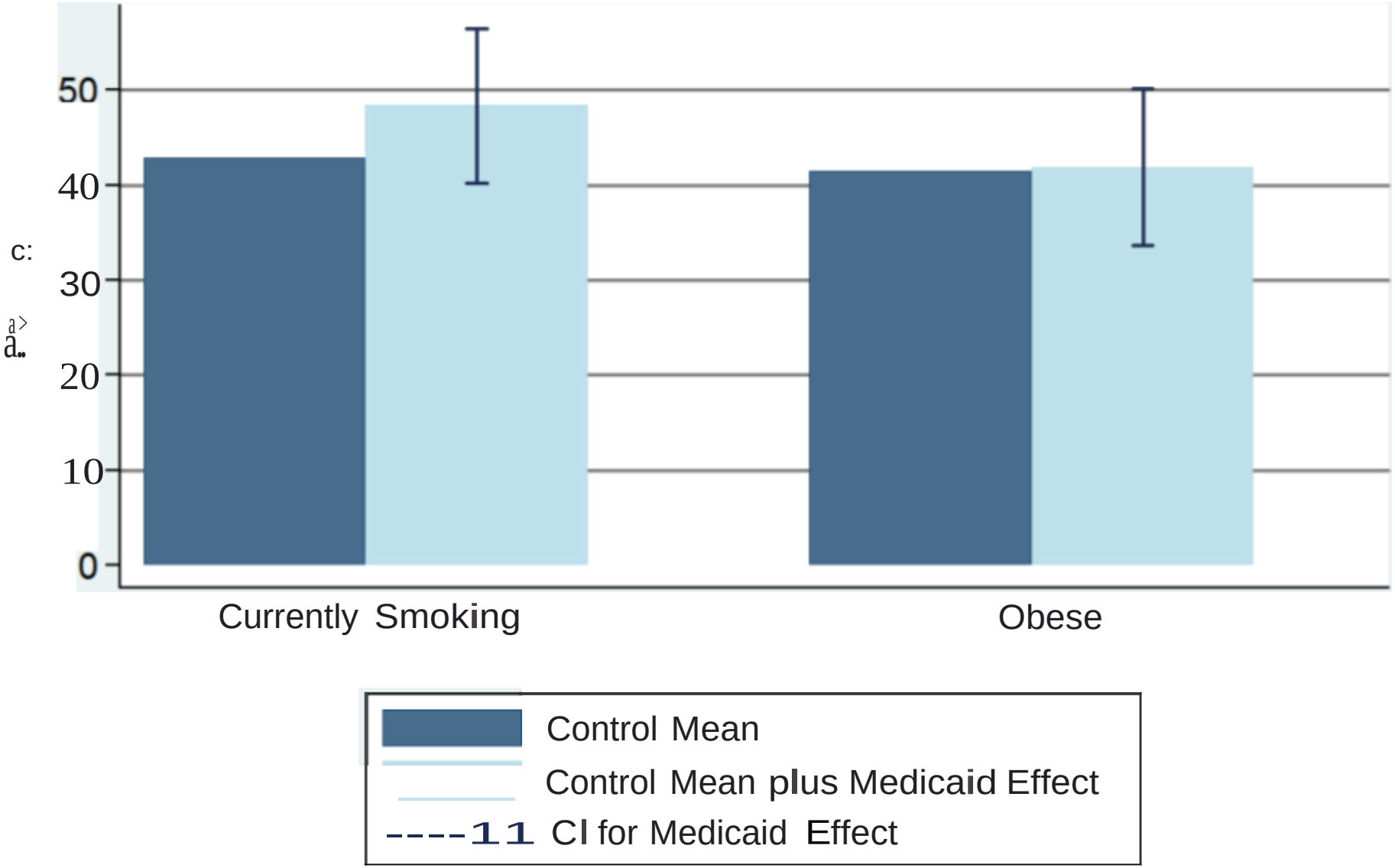
Inperson Survey Data



*A Higher SF-8 score indicates higher self-reported quality of life. The scale is normalized to yield means of 50 and standard deviations of 10 in the general U.S. population; the range is 0 to 100.

Smoking and Obesity

Inperson Survey Data



Summary

- One to two years after expanded access to insurance:
  - Increases in health care use (and associated costs)
  - Increases in compliance with recommended preventive care
  - Improvements in quality and access
  - Reductions in financial strain
  - Improvements in self-reported health
  - Improvements in depression
  - No significant change in specific physical measures
- Sense of the relative magnitude of the effects
  - Use and access, financial benefits, general health, depression
  - Physical measures of specific chronic conditions

Extrapolation to ACA Expansion

- Context quite relevant for health care reform:
  - States can chose to cover a similar population in planned 2014 Medicaid expansions (up to 138% of FLP)
- But important caveats to bear in mind:
  - Oregon and Portland vs. US generally
  - Voluntary enrollment vs. mandate
  - Partial vs. general equilibrium effects
  - Short run (1-2 years) vs. medium or long run

Updating based on our findings

- "Medicaid is worthless or worse than no insurance"
  - We see increases in utilization and perceived access and quality, reductions in financial strain, improvement in self-reported health, improvement in depression, and can reject large declines in several physical measures
- "Health insurance expansion saves money"
  - In short run we see increases in utilization and cost and no change in emergency department use
  - We see increases in preventive care, improvements in self-reported health, and improvements in depression

Conclusion

- Effects of expanding Medicaid likely to be manifold
  - Hard to establish with observational data (often misleading)
- Expanding Medicaid generates both costs and benefits
  - Increases spending
  - Measurably improves some aspects of health but not others
    - Weighing them depends on policy priorities – "ink blot" for policy priors
- Further research on alternative policies needed
  - Many steps in pathway between insurance and outcome
  - Role for innovation in insurance coverage
  - Complements to health care (e.g. social determinants)

Always an Adventure

Acknowledgments

- Study Participants
- State of Oregon
- Consultants: CDC National Center for Health Statistics, Thom McDade and Stacy Lindau, University of Washington
- Funders
  - NIA, RWJ, SRF, Sloan, MacArthur, CHCF, SSA, ASPE, CMS


PROJECT FUNDED BY THE
American Recovery
and
Reinvestment Act
RECOVERY.GOV
USDOT
TIGER