

# What Do Workplace Wellness Programs Do?

## Evidence from the Illinois Workplace Wellness Study

[www.nber.org/workplacewellness](http://www.nber.org/workplacewellness)

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July 24, 2019

# Acknowledgments



National Institute  
on Aging



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NORTH AMERICA



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Evidence for Action



Robert Wood Johnson Foundation

W.E. UPJOHN INSTITUTE  
*for Employment Research*

This research was supported by the National Institute on Aging of the National Institutes of Health under award number R01AG050701; the National Science Foundation under Grant No. 1730546; Evidence for Action (E4A), a program of the Robert Wood Johnson Foundation; the Abdul Latif Jameel Poverty Action Lab (J-PAL) North America U.S. Health Care Delivery Initiative; and the W.E. Upjohn Institute for Employment Research. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health, any of our funders, or the University of Illinois.

# Workplace wellness programs are growing rapidly

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  - Aims: reduce health care costs, improve employee health, increase productivity
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- Workplace wellness is popular among policymakers
  - Affordable Care Act "Safeway Amendment" encourages these programs
  - Some advocate expanding to Medicare, Medicaid
- Workplace wellness programs are controversial
  - Do they actually improve health and productivity?
  - Do financial incentives shift costs onto certain groups of employees?

# Prior evidence is mixed and limited

- Mixed results on effects of wellness programs
  - Meta analysis by Baicker, Cutler, and Song (2010) found
    - Medical cost reduction of \$3.27 for every \$1 spent on wellness
    - Absenteeism cost reduction of \$2.73 for every \$1 spent on wellness
  - Cost reduction estimates decreasing in study quality (Gowrisankaran et al. 2013)
  - Recent 18-month RCT finds no effect on medical spending or behaviors (Song and Baicker 2019)

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  - Recent 18-month RCT finds no effect on medical spending or behaviors (Song and Baicker 2019)
- Empirical challenges:
  - Selection bias from non-random participation
  - Potential for publication bias
  - Measurement and power

# The Illinois Workplace Wellness Study

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  - 12,459 employees invited: faculty (26%), administrative and union service positions (74%)
  - Individual, random assignment to control or treatment groups



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  - [Individual, random assignment](#) to control or treatment groups
- Rich data linked at individual level allows for comprehensive evaluation
  - Administrative data on employment and health insurance claims
  - Administrative data on health behaviors (gym use, running events)
  - Survey data
  - Detailed biometric data
- Study was pre-registered in the AEA RCT Registry

# Today: Two research questions

- ① Who participates in workplace wellness?
  - Distributional consequences
- ② What are the effects of workplace wellness after thirty months?
  - Medical spending
  - Employee productivity
  - Health behaviors

# Summary of main findings

- ① Significant advantageous selection on health
  - Workplace wellness programs might act as profitable screening mechanisms
- ② No significant causal effects on medical spending or employee productivity
  - We rule out the widely cited return on investment for wellness programs (Baicker, Cutler, and Song 2010)

# Study Design:

Illinois Workplace Wellness Study

# Background on workplace wellness programs

- Three main components:
  - ① **Biometric health screening**
  - ② **Health risk assessment (HRA)**
  - ③ **Wellness activities**
- We designed a “gold-standard” wellness program (iThrive)
  - Includes all three components above
  - Includes financial incentives tied to participation
  - Allows employees to take paid time off to participate

## Study enrollment (July 2016)

- Enrollment predicated on completing a 15-minute online survey
- Survey invitations sent to 12,459 employees
  - Postcard notification sent to employee home address (July 6, 2016)
  - Email invitation to employees, with personalized link to online survey (July 11)
- Employees were offered \$30 Amazon.com gift card, plus a chance “to participate in a second part of the research study”

# Study invitation postcard

## Illinois Workplace Wellness Study

You have been selected to take an online survey as part of the Illinois Workplace Wellness Study.

The purpose of this survey is to better understand health behaviors and wellness on campus.

Check your University of Illinois email on July 11th for instructions and a link to the survey.

All respondents will receive a **\$30 Amazon.com Gift Card** for completing the survey.

For more information: [WellnessStudy@illinois.edu](mailto:WellnessStudy@illinois.edu)



ILLINOIS

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Illinois Workplace Wellness Study

9. Are you currently trying to increase your physical activity or exercise?

Yes

No

Back

Next

16%

A horizontal progress bar with a dark teal segment on the left and a light grey segment on the right. The dark teal segment is labeled '16%'.



# Illinois Workplace Wellness Study

You left an answer blank. If this was intentional, please click "Next" and proceed with the rest of the survey. If not, please answer the question.

9. Are you currently trying to increase your physical activity or exercise?

Yes

No

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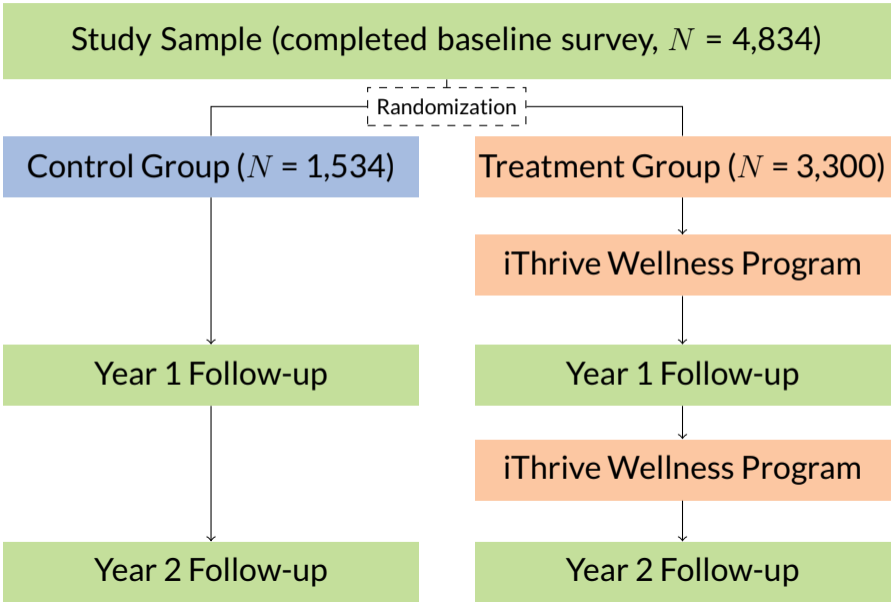
Back

Next

# Survey responses were very complete

- **Response:** 4,834 employees (38.8%) successfully completed baseline survey
  - Survey open for three weeks, with periodic email reminders
- **Completeness:** Fewer than 1% of respondents skipped *any* question
- **Validity:** Age, sex responses match University administrative records closely
  - Last questions on the survey
  - 99.4% within 1 year of age reported in University records

# Experimental design: Illinois Workplace Wellness Study



# Participating in iThrive involved two steps

## Step 1: Screening

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### *Biometric Screening*

- 8 different on- and off-campus locations
- Fingertick + blood pressure, height, weight, waist circumference

### *Health Risk Assessment (HRA)*

- Online questionnaire designed to assess lifestyle habits

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## Step 2: Wellness Activities

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- Many options, e.g., Weight Watchers, smoking cessation, stress management
- Classes ranged from 6-12 weeks
- Completion defined as attending at least 3/4 of sessions

## Participating in iThrive involved two steps

### Step 1: Screening — up to \$200 reward

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### Step 2: Wellness Activities — up to \$75/semester

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## My Portal

My Portal gives you information about your progress in iThrive, a program to promote health and wellness among campus faculty and staff. iThrive offers you the opportunity to participate in valuable health screening and wellness activities at no cost to you. In addition, you can receive financial rewards for completing certain elements of iThrive.

**To earn rewards and to participate in Wellness Activities, you must complete your Health Screening by Friday, September 16th and the Health Assessment by Friday, September 30.**

Your participation reward: \$200.00 of \$350.00 earned so far



### Step 1: Health Screening & Assessment

The first step in iThrive is to complete your Health Screening and Health Assessment. After you complete your Health Screening, you will be able to access your online Health Assessment. [Learn more about Health Screening & Assessment >>](#)

Congratulations! You have completed your Health Screening and Health Assessment.

**Reward for completing both the Health Screening and Health Assessment: \$200.00**



Health Screening completed



Health Assessment completed



### Step 2: Wellness Activities

After you have completed Step 1, you may register to participate in a wellness activity. You may use the information provided to you in your Health Assessment to select a program that best addresses an area of your health that you would like to improve. [Learn more about Wellness Activities >>](#)

Registration for Fall Activities is now closed. More information about Spring Activity registration will be made available soon.

**Reward for completing Fall activity: \$75.00**

**Reward for completing Spring activity: \$75.00**



Fall activity not completed. Registered for HealthTrails



Spring activity not completed

# Data and Results:

Illinois Workplace Wellness Study



# We construct 42 outcomes from our datasets

- Medical spending and utilization (8 outcomes)
- Health status and behaviors (17 outcomes)
- Employment and productivity (17 outcomes)

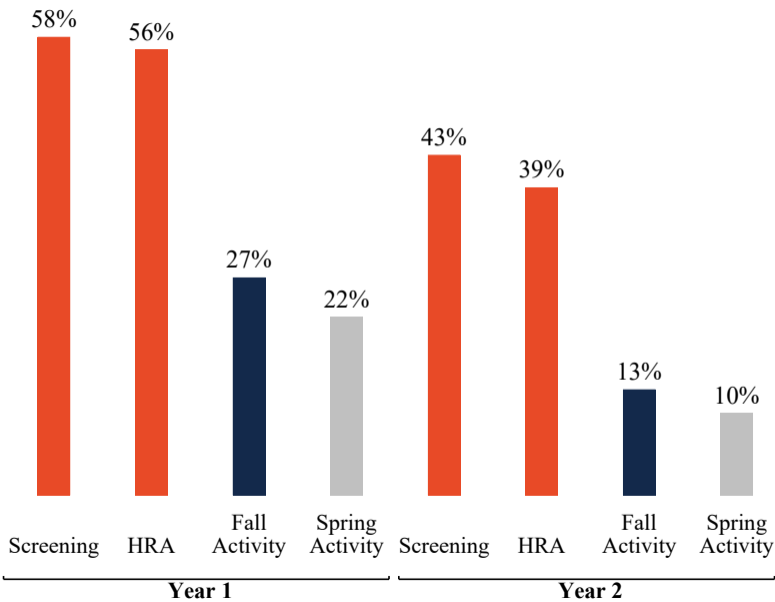
# 17 measures of productivity from survey and admin data

- Administrative measures (5 outcomes)
  - Job title change, annual salary → “job promotion”
  - Job retention
  - Sick leave taken
  
- Online survey measures (11 outcomes)
  - Worked 50+ hours/week
  - Job satisfaction, job search
  - Feel productive at work, feel happy at work, received promotion
  
- First principle component of all available measures (1 outcome)
  - “Productivity index”

## Baseline summary statistics: administrative data

	Control	Treat	<i>p</i> -value	<i>N</i>
<b>Demographics</b>				
Male	0.426	0.428	0.90	4,834
Age 50+	0.323	0.327	0.82	4,834
White	0.841	0.836	0.65	4,834
Faculty	0.196	0.201	0.72	4,834
<b>Health claims</b>				
Total spending (dollars/month)	506	465	0.32	3,222
<b>Health behaviors</b>				
Running event participant	0.107	0.118	0.13	4,834
Gym visits (days/year)	7.36	6.78	0.48	4,834
<b>Productivity</b>				
Sick leave (days/year)	6.05	6.13	0.71	4,834
Annual salary (dollars)	61,528	61,736	0.84	4,770
<b>Sample size</b>				
	1,534	3,300		

# Treatment group participation in our workplace wellness program



# We present two sets of results

- ① Selection into workplace wellness
- ② Causal effects of workplace wellness
  - Short-run (12 months)
  - Longer-run (24-30 months) [\[new!\]](#)

## Results 1: Who participates in workplace wellness programs?

$$X_i = \alpha + \theta_x P_i + \varepsilon_i$$

- Observations: employees assigned to the treatment group
- $X_i$  selection variable, “pre-determined” prior to intervention
- $P_i$  indicator for completing both health screening and HRA in the first year

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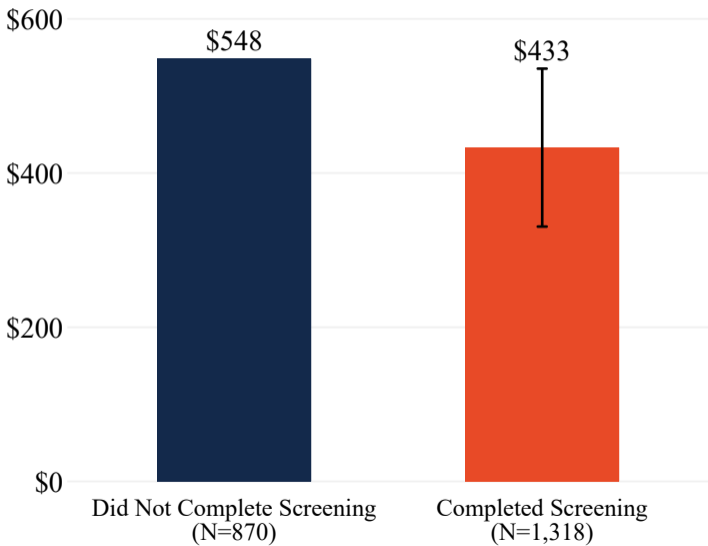
WYOUNG: Stata module for performing multiple hypothesis testing

Install by typing “`ssc install wyoung`” at Stata prompt



# Participants already had lower health spending

Figure: Pre-intervention, average monthly medical spending



Vertical bars display 95% confidence intervals on the difference in means.

# Participants already had healthier behaviors

Figure: Average annual gym visits

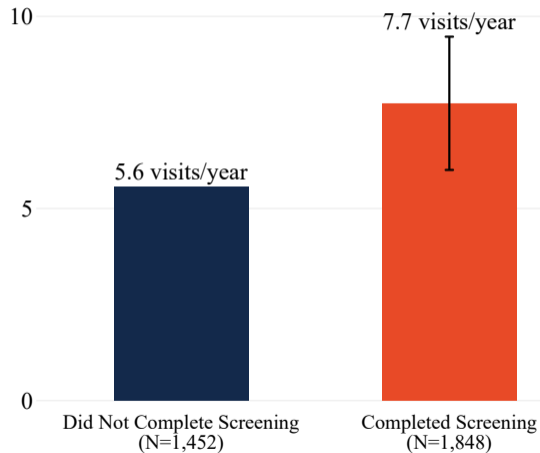
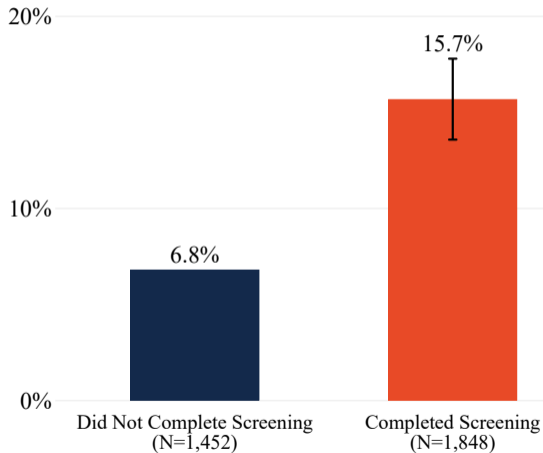


Figure: Running event participation



Vertical bars display 95% confidence intervals on the difference in means.

# Participants were spending less time at work

Figure: Worked 50+ hours/week (survey)

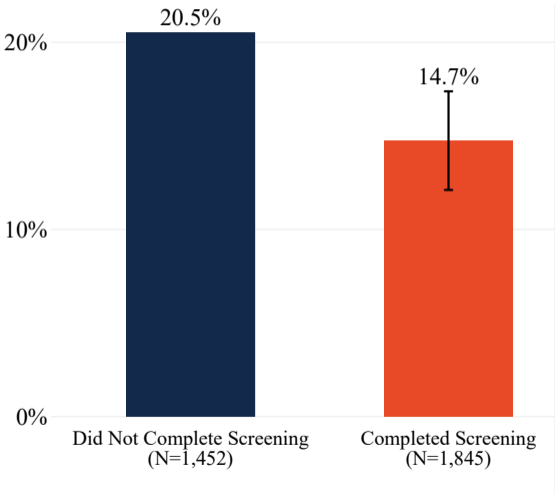
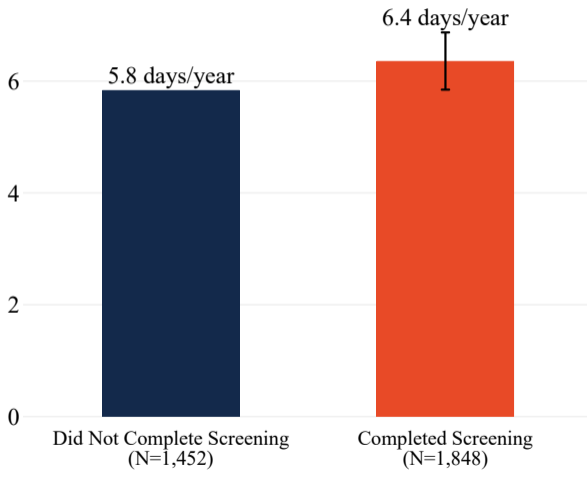


Figure: Sick leave taken



Vertical bars display 95% confidence intervals on the difference in means.

## Results 2: Causal effects of workplace wellness

$$Y_i = \alpha + \beta T_i + \gamma X_i + \varepsilon_i$$

- Observations: employees assigned to treatment or control group
- $Y_i$  outcome variable
  - We consider 42 different survey and administrative data outcomes
- $T_i$  indicator for treatment assignment
- $X_i$  controls (none or post-Lasso)

# Intervention reduced number of employees with no health screenings

Figure: Never had a screening (12-month survey)

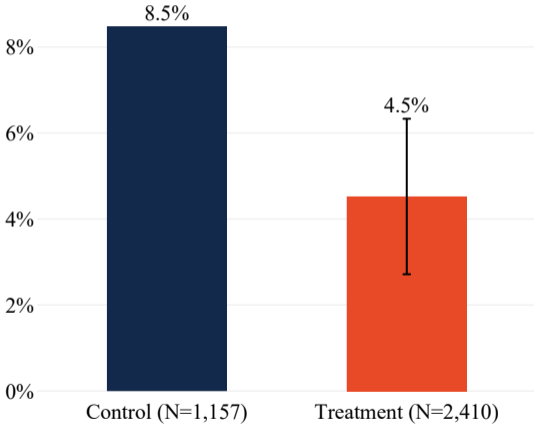
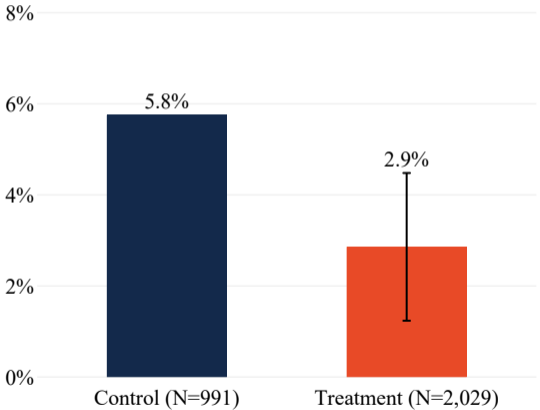
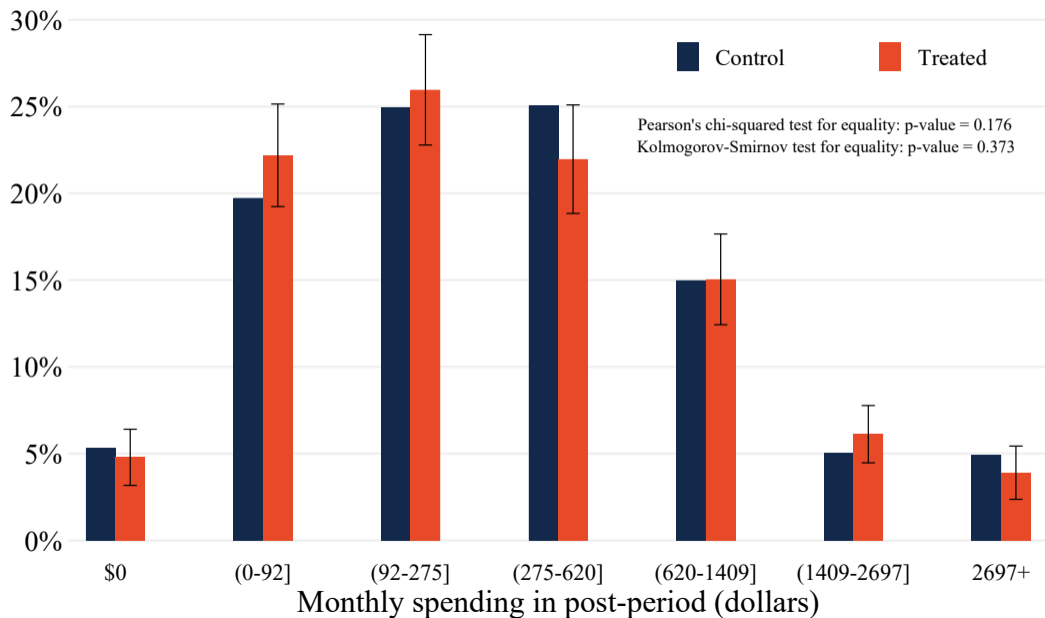


Figure: Never had a screening (24-month survey)



Vertical bars display 95% confidence intervals on the difference in means.

# No causal effect on medical spending after 30 months



# No causal effect on health behaviors after 30 months

Figure: Average annual gym visits

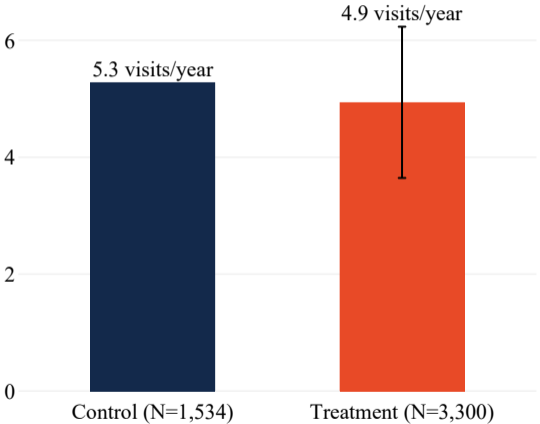
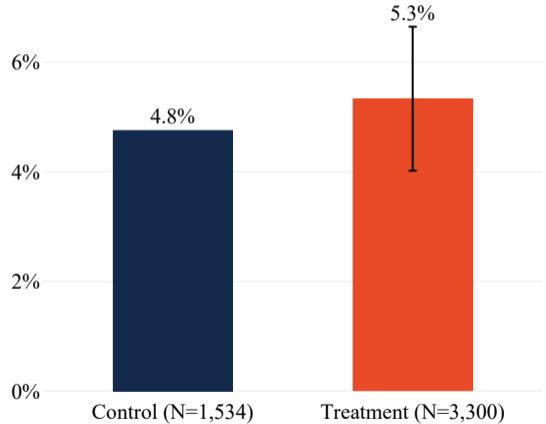


Figure: Running event participation



Vertical bars display 95% confidence intervals on the difference in means.

# No causal effect on employee productivity after 30 months

Figure: Received job promotion

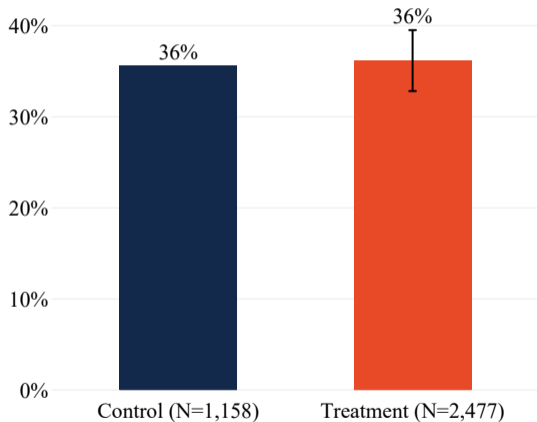
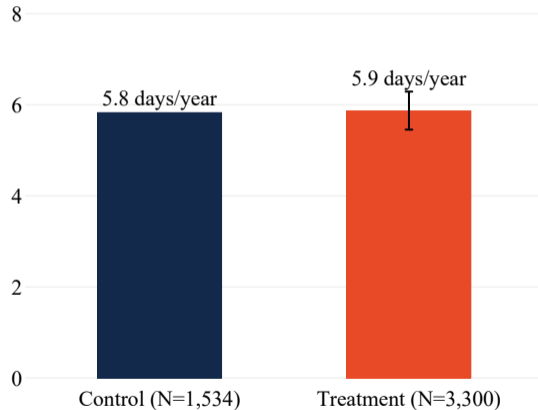


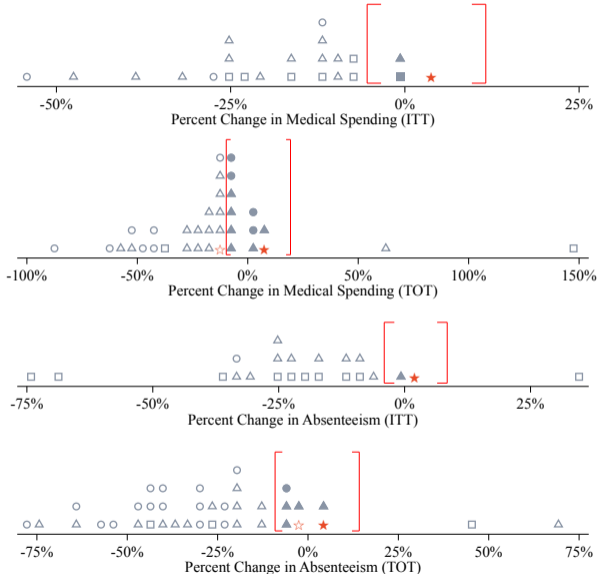
Figure: Sick leave



Vertical bars display 95% confidence intervals on the difference in means.



# We rule out 84% of prior studies on spending, absenteeism



Orange shaded star is our RCT estimate. Red brackets depict 95% confidence intervals.

# Why do our results differ from prior studies?

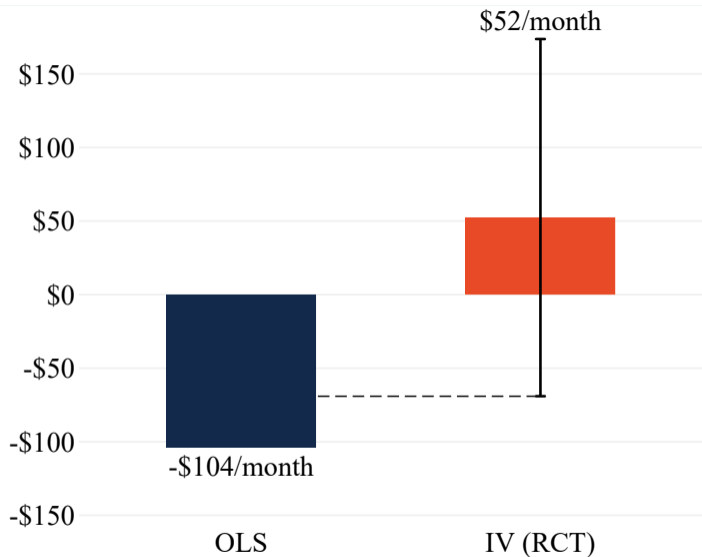
- ① Treatment effects in our program/setting may differ (effect heterogeneity)
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**What happens if we estimate an observational model using our data?**

## Observational model estimates a reduction in medical spending



OLS and IV controls selected using post-Lasso. Vertical bars display 95% confidence interval for IV estimate.

# Observational model estimates an improvement in health behaviors

Figure: Average annual gym visits

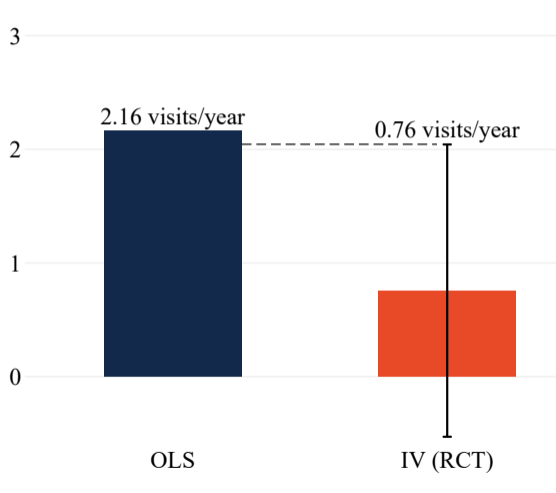
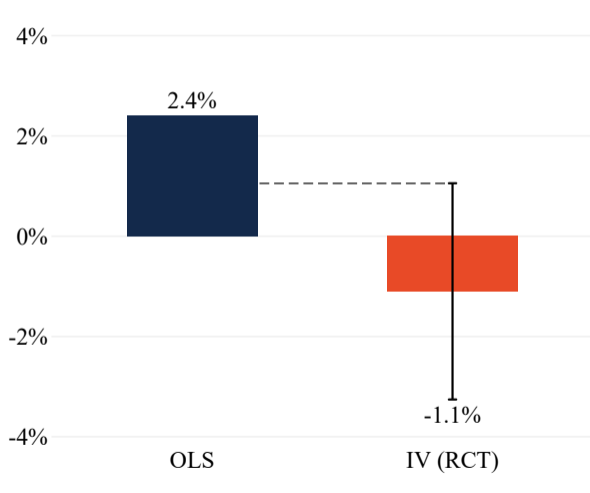
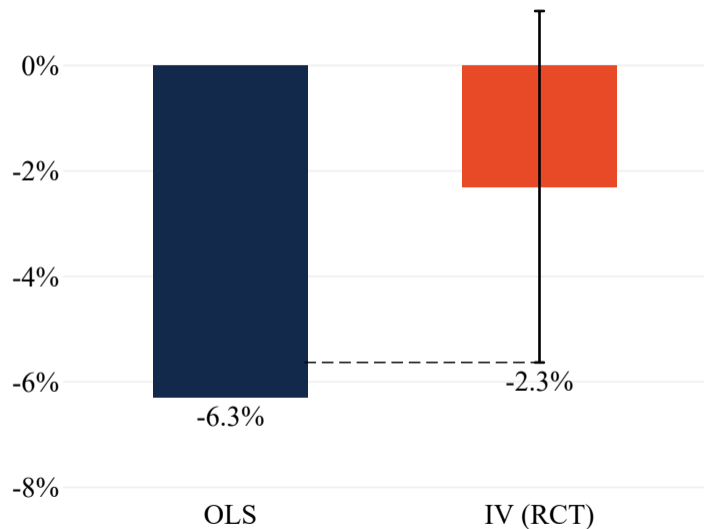


Figure: Running event participation



OLS and IV controls selected using post-Lasso. Vertical bars display 95% confidence interval for IV estimate.

## Observational model estimates a reduction in job exit after 12 months



OLS and IV controls selected using post-Lasso. Vertical bars display 95% confidence interval for IV estimate.

# What have we learned from the Illinois Workplace Wellness Study?

- 1 Participants were already healthier and had lower medical spending
  - Wellness programs shift costs onto less healthy employees
  - Wellness programs may be effective way to attract healthy workers
- 2 No effects on medical spending, health behaviors, or productivity after 30 months
  - We rule out majority of estimates from prior studies
- 3 Observational health studies likely to suffer selection bias, even with rich controls (Oster 2019)

# Illinois Workplace Wellness Study

[www.nber.org/workplacewellness](http://www.nber.org/workplacewellness)



# Appendix Slides:

Illinois Workplace Wellness Study

## Associations between 2017 survey and admin measures of productivity

	(1) Salary (% change)	(2) Job pro- motion	(3) Job title change	(4) Job ter- minated	(5) Sick leave (days/year)
Any sick days in past year [survey]	-0.009* (0.005)	0.005 (0.014)	0.009 (0.014)	-0.026*** (0.007)	3.242*** (0.240)
Worked 50+ hours/week [survey]	0.006 (0.007)	-0.032* (0.018)	-0.036** (0.018)	0.011 (0.010)	-3.278*** (0.295)
Very/somewhat satisfied with job [survey]	0.026*** (0.005)	0.050*** (0.017)	0.043** (0.017)	-0.026** (0.011)	-1.440*** (0.334)
Received promotion [survey]	0.050*** (0.005)	0.229*** (0.013)	0.225*** (0.013)	-0.013* (0.007)	0.007 (0.246)
Job search very likely [survey]	0.003 (0.007)	-0.049** (0.019)	-0.046** (0.020)	0.166*** (0.018)	-1.522*** (0.347)
Outcome mean	0.061	0.184	0.192	0.045	6.473

Notes: Each row and column reports estimates from a separate regression, with dependent variable given by column header.

# Baseline summary statistics: online survey data

	Control	Treat	<i>p</i> -value	<i>N</i>
Ever screened	0.885	0.892	0.503	4,834
Physically active	0.359	0.382	0.134	4,834
Trying to be active	0.822	0.809	0.278	4,834
Current smoker	0.072	0.065	0.428	4,833
Current smoker (other)	0.085	0.085	0.960	4,833
Former smoker	0.198	0.196	0.870	4,833
Drinker	0.657	0.645	0.423	4,830
Heavy drinker	0.050	0.049	0.955	4,829
Chronic condition	0.729	0.726	0.824	4,834
Excellent/v. good health	0.586	0.602	0.281	4,834
Not poor health	0.989	0.989	0.882	4,834
Physical problems	0.392	0.388	0.793	4,834
Lots of energy	0.310	0.330	0.171	4,834
Bad emotional health	0.308	0.288	0.162	4,834
Overweight	0.545	0.533	0.438	4,834
High BP/cholesterol/glucose	0.308	0.295	0.354	4,834
Sedentary	0.545	0.542	0.846	4,833
Pharmaceutical drug utilization	0.723	0.706	0.205	4,830
Physician/ER utilization	0.772	0.748	0.077	4,833
Hospital utilization	0.038	0.027	0.054	4,833
<b>Sample size</b>	1,534	3,300		