

# The Impact of Financial Wellness Incentives on Hospitalizations and Medical Care Use

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February 7, 2010

# Acknowledgements

- We acknowledge funding from the Missouri Foundation for Health, the Commonwealth Fund, and the Center for Health Policy at Washington University
- This research has been performed by the Healthy Outcomes Team of the Center for Health Policy at Washington University in St. Louis
- We thank “UnivCo,” “HospCo” and “LargeCo” for providing us with data for this analysis
- We thank HSI Network (principal Steve Parente, Ph.D.) for data deidentification services

# Introduction

- Diabetes mellitus, cardiovascular disease and lower respiratory disease are among the leading causes of disability and premature death
- Employers bear many of the costs for these diseases, causing them to start offering prevention services
- A newer workplace intervention is the use of financial incentives tied to employer health insurance premiums
- Proposed legislation seeks to expand these discounts

# Debate about workplace financial incentives for wellness: Time magazine, Nov. 30, 2009



# Our “quasi-experiment” on prevention

- We examine the impact of wellness incentives using data from a hospital system based in a large midwestern metropolitan area
- “HospCo” implemented a comprehensive wellness and health promotion incentive in Jan. 2005
- We have a four year panel of data from 2003-06
  - Panel tracks virtually every employee and dependent
  - Data are deidentified but link health and pharma claim records for each enrollee

## Comparison (or control) group

- We have similar data from same metro area for employees for two comparison groups, “UnivCo” and “LargeCo”
- Benefits were stable for UnivCo and for LargeCo employees during the sample period
- This allows for a difference-in-difference identification
  - Pre-post
  - HospCo versus UnivCo and LargeCo

# What wellness incentives?

- Employees and dependents at HospCo would obtain lower health insurance costs starting Jan. 2005 if they:
  - Filled out a health risk assessment form on body measurements, weight, blood pressure, blood glucose level, and cholesterol
  - Signed a health pledge
  - If they smoked, enrolled in a free smoking cessation program
- Preventive care coverage was provided without a copay
- Biometric information was optional for dependents
- Changes were not limited to insurance offerings
  - HospCo offered on-site health fairs to obtain biometrics
  - They indicated that wellness was an institutional priority
  - But, they made no changes in disease management
- Wellness changes coincided with other changes in benefits

## How much money would they save?

- In Jan. 2005, employees were offered three health plans, Gold, Silver and Bronze
- The Gold plan was only offered to wellness compliers
- Cost of (Gold – Undiscounted Silver) to *HospCo* ranged from \$755 (employee only) to \$1,647 (family coverage)
- Gold was chosen by 79% of covered employees
- Incentives were preceded by much smaller wellness program in Jan. 2004



# Methods

- We examine:
  - Hospitalizations associated with targeted conditions
  - Hospitalizations without targeted conditions
  - Physician visits, overall and for targeted conditions
- Targeted conditions:
  - Diabetes mellitus
  - Cardiovascular: hypertensive heart disease; ischemic heart disease; cerebrovascular disease
  - Respiratory: acute pulmonary infections, COPD
- To determine pathways, also examine medication use:
  - Overall
  - Diabetes meds
  - Antihypertensive meds
  - Anticholesterol meds

## Methods (continued)

- Logit or Poisson regressions of each outcome on:
  - Exposure to wellness incentives, i.e., HospCo enrollee interacted with Jan. 2005 or after
  - Month dummies; month-of-year employer interactions; age-gender interactions
- Drop employees who start or stop coverage in Jan. 2005 (Jul. 2004/05 at UnivCo) to minimize selection bias

# Characteristics of sample

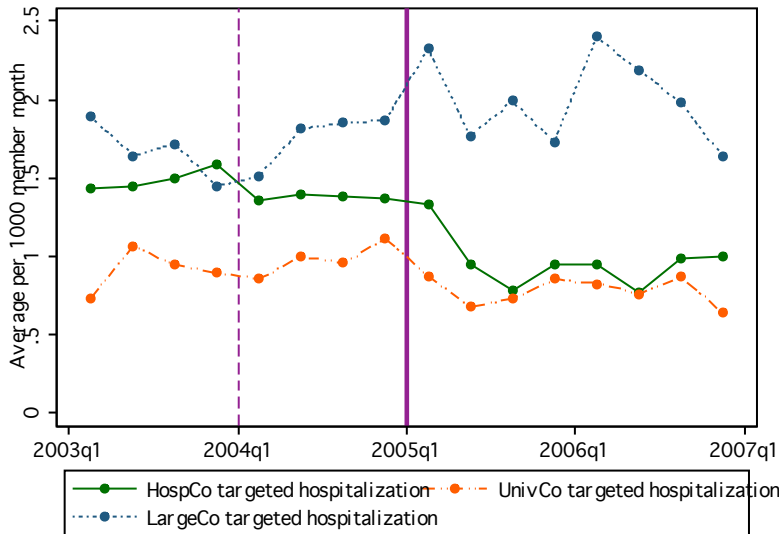
	<b>HospCo</b>	<b>UnivCo</b>	<b>LargeCo</b>
Sample dates		Jan. 2003 – Dec. 2006	
Average number of enrollees per month	30,212	16,844	14,723
Median age	34	34	34
Percent female	59.9%	55.0%	54.0%
Person-months with hospital admission	11,462	4,746	5,973
Person-months with admission without targeted condition	9,800	4,093	4,787
Person-months with admission for any targeted condition	1,727	692	1,307
With mention of specific targeted condition of:			
diabetes mellitus	252	113	234
hypertensive heart disease	277	134	286
cerebrovascular disease	313	87	192
ischemic heart disease	645	276	450
acute pulmonary infection	359	145	252
COPD	126	44	91
Average prescription days filled per month	27.64	23.44	31.48
with antihypertensive medications	4.93	3.23	4.39
with anti-cholesterol medications	1.66	1.45	2.01
with diabetes medications	1.68	1.03	1.90

Note: non-targeted and overall conditions exclude visits with mental health diagnoses; new visits defined by no previous visit with condition in the past 6 months; UnivCo data include slightly less observations for prescription days

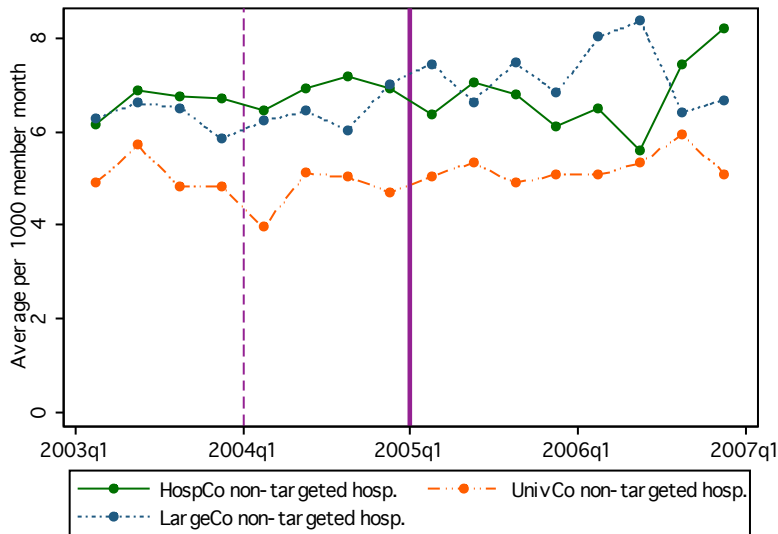
# Claims data

- Medical/hospital claims data contain:
  - Date of beginning of service
  - Date of end of service (for overnight hospital stays)
  - ICD-9-CM diagnosis codes – at least 1, sometimes 3
  - CPT1 procedure codes
- We calculate days in the hospital by recording all days with at least one multi-day claim
- We calculate ER and physician visits by the presence of at least one claim with a given “from” date
- We calculate presence of a condition in a month by at least one claim in that month with that ICD-9 code
- Pharma claims data:
  - Provides NDC number and number of days supplied
  - We created data on drug category by NDC number

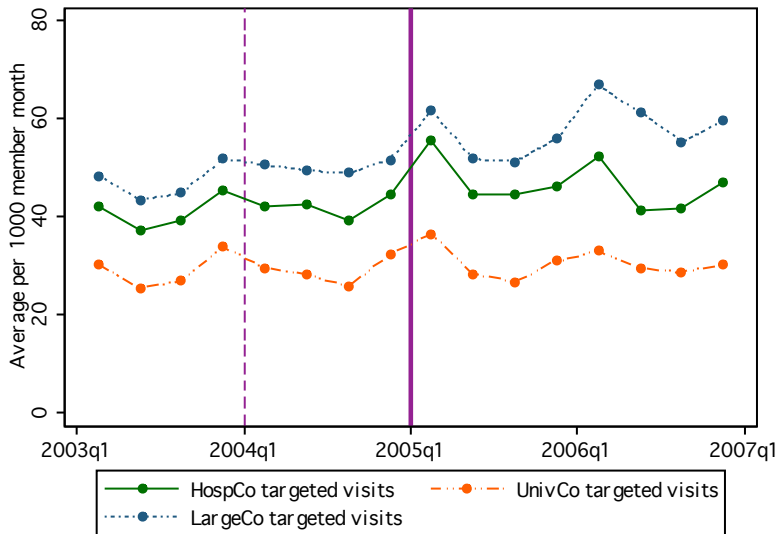
# Hospitalization for targeted conditions



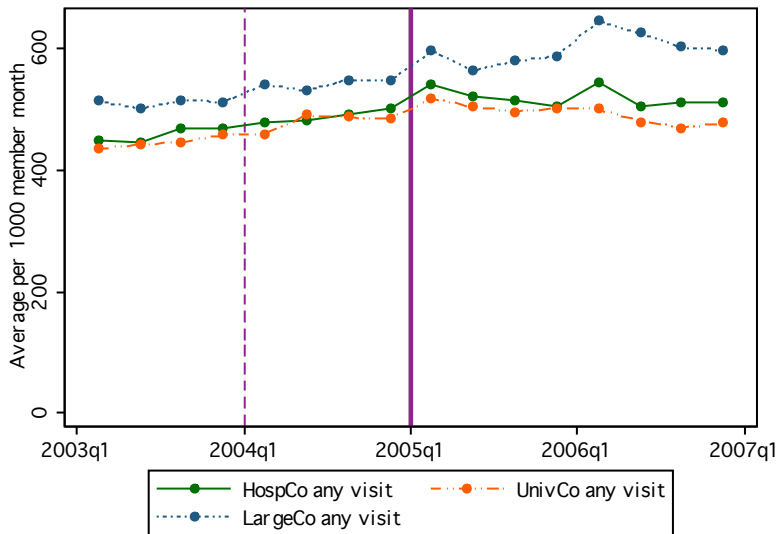
# Hospitalization for non-targeted conditions



# Non-inpatient visits for targeted conditions

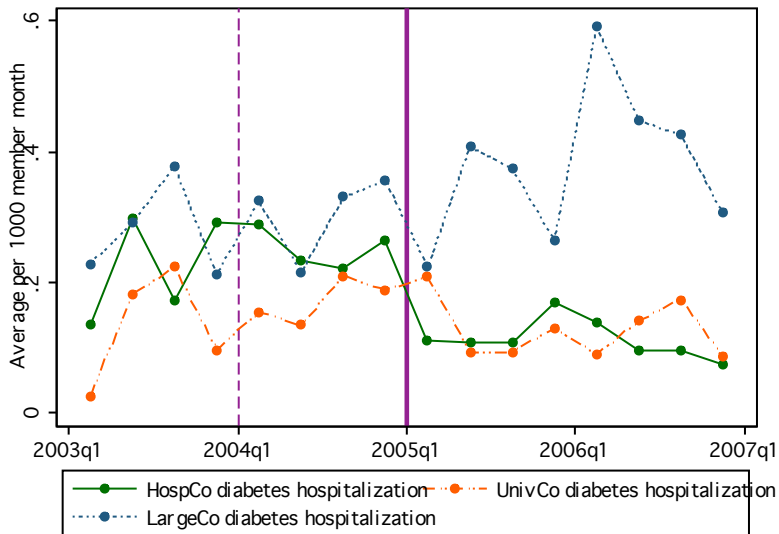


# Non-inpatient visits overall

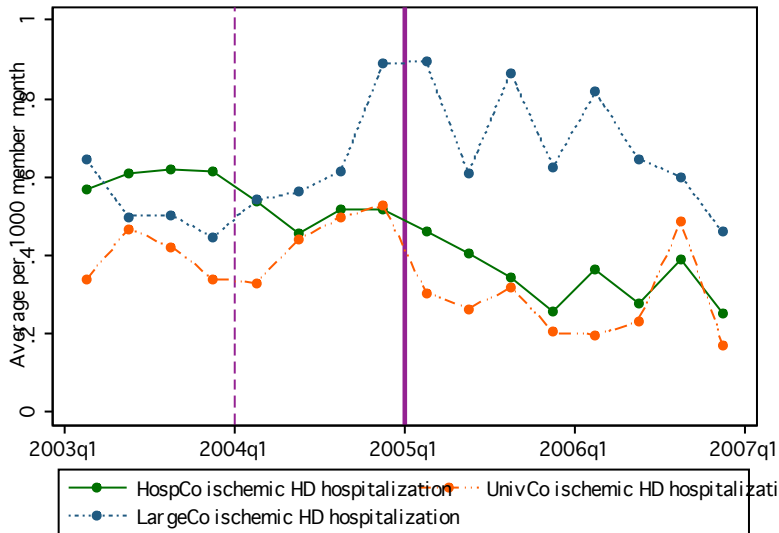




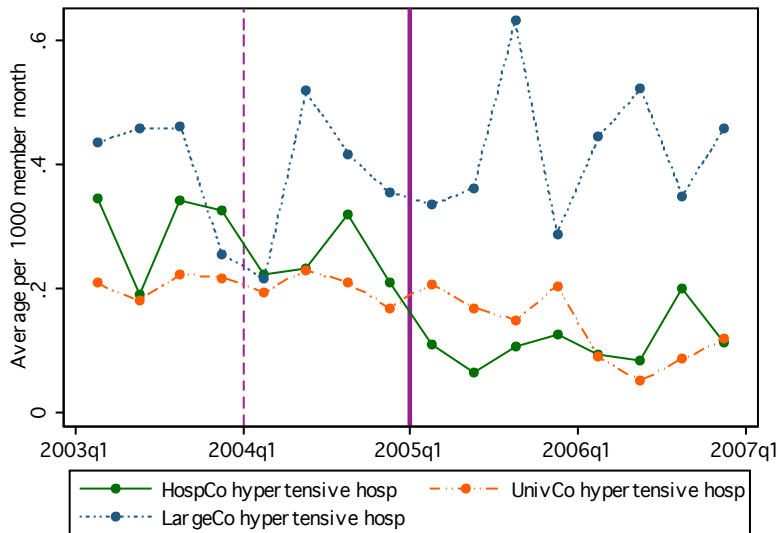
# Hospitalization for diabetes



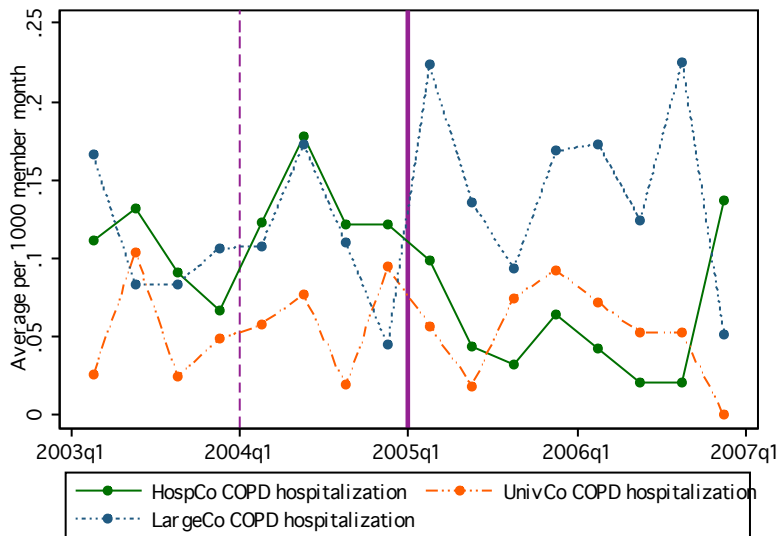
# Hospitalization for ischemic heart disease



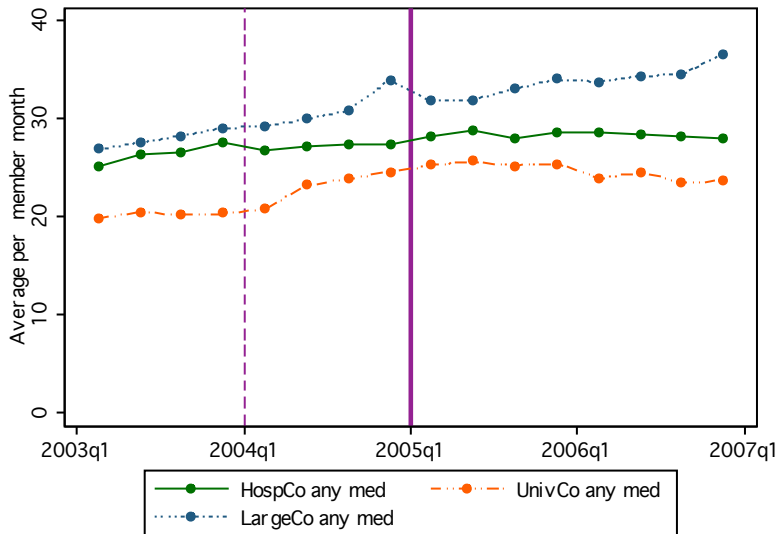
# Hospitalization for hypertensive heart disease



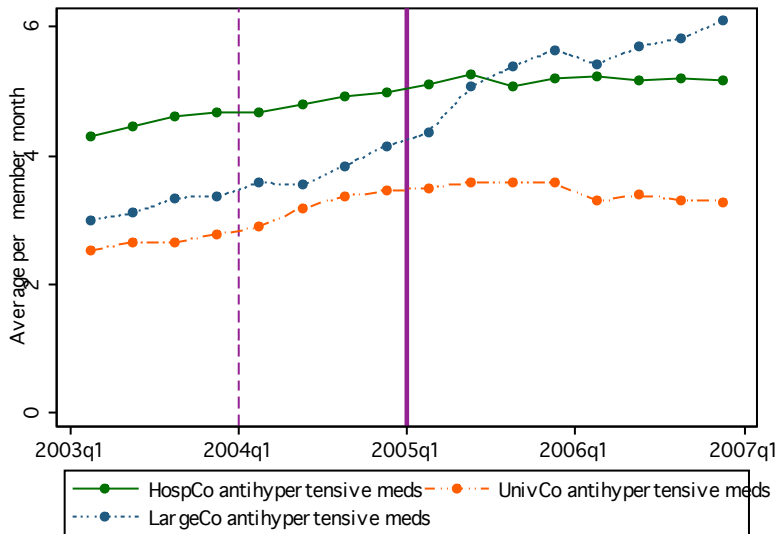
# Hospitalization for COPD



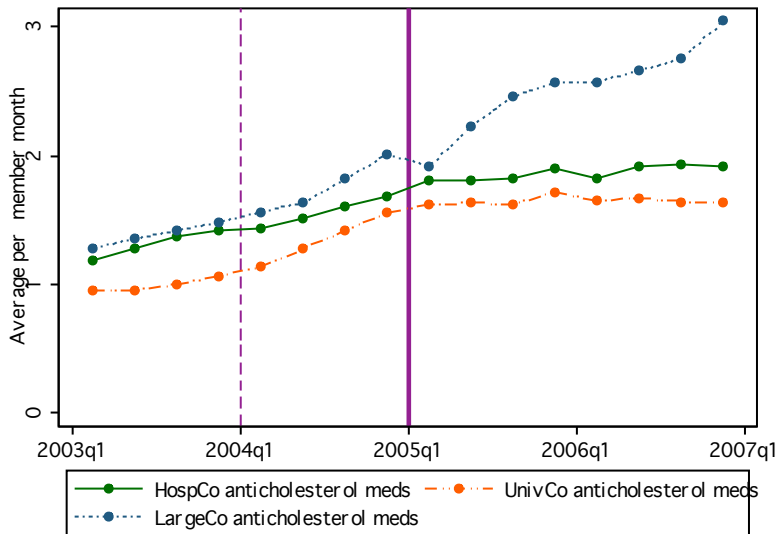
# Number of days of medications



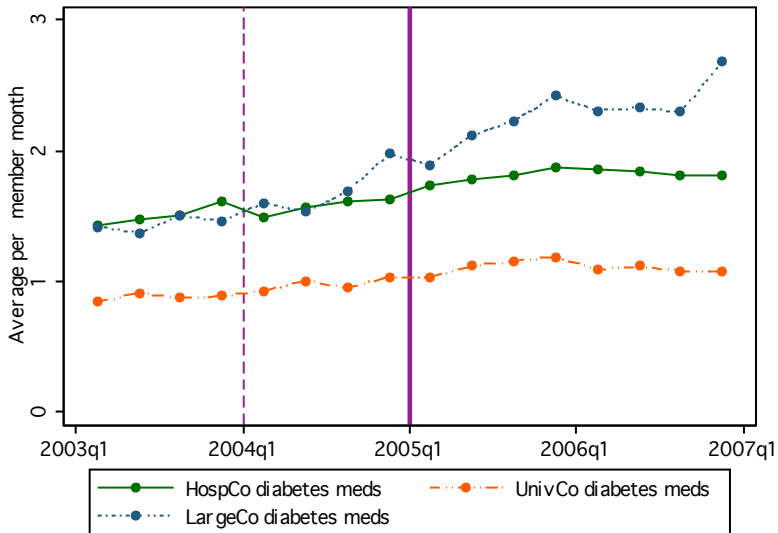
# Number of days of antihypertensive medications



# Number of days of anticholesterol medications



# Number of days of diabetes medications





# Regression results

Condition	Unit of observation	Baseline	Percent change due to wellness program	95% confidence interval for change
<b>Inpatient hospitalizations</b>	Person-months with admission per 1000 PM			
Any hospitalization		8.79	-12%***	[-18%, -6.4%]
Non-targeted conditions		7.50	-9.8%**	[-16%, -3.5%]
Any targeted conditions		1.42	-31%***	[-41%, -18%]
With mention of specific targeted condition of:				
diabetes mellitus		.321	-56%***	[-72%, -30%]
hypertensive heart disease		.386	-55%***	[-69%, -33%]
cerebrovascular disease		.436	-25%	[-52%, 14%]
ischemic heart disease		.821	-30%**	[-45%, -10%]
acute pulmonary infection		.257	-15%	[-41%, 22%]
COPD		.281	-58%**	[-79%, -15%]
<b>Prescriptions filled</b>	Days of medication per person-month			
Any medication		29.33	-3.2%***	[-4.6%, -1.7%]
Anti-hypertensive medications		6.00	-14%***	[-16%, -11%]
Anti-cholesterol medications		2.00	-6.4%***	[-11%, -2.0%]
Diabetes medications		1.97	-7.6%*	[-13%, -1.4%]

\*P<.05, \*\*P<.01, \*\*\*P<.001

Note: non-targeted and overall conditions exclude visits with mental health diagnoses

# Wellness incentives and new HospCo visits

Condition	Number of new non-inpatient visits Q4:2003 and Q1:2004	Number of new non-inpatient visits Q4:2004 and Q1:2005	Difference between columns (3) and (2)	Estimated number of 2005 hospitalizations avoided by wellness incentives	(5) as a percent of (4)
Diabetes mellitus	375	456	81	52.2	64.4%
Hypertensive heart disease	1,298	1,498	200	50.7	25.4%
Ischemic heart disease	194	274	80	54.2	67.8%

Note: new visits defined by no medical visit for that condition within prior six months

# Discussion

- Evidence from hospitalizations consistent with wellness incentives causing impact on health outcomes
- Unlikely that our findings are due to non-random selection
- Unlikely that results due to differences in trends at HospCo from control employers
  - Noticeable drop in 2005, soon after program commenced
  - Drop mostly occurring in targeted conditions
- No changes in disease management at HospCo in 2005
- Results unlikely due to trends across geographic locations
  - Not sensitive to inclusion of zip code fixed effects

# Potential mechanisms

- ① Smoking cessation
  - Community-wide public area smoking bans have reduced cardiac hospitalizations by 11.2% to 40% over similar time
- ② Screening may have led to earlier detection
  - Entire hypertensive heart disease results explained if 25% of new HHD patients avoid hospitalization
  - A likely pathway is meds, but no conclusive results here
- ③ Screening process itself led to motivation for behavioral changes
  - Physicians staffing health fairs say that the fairs may have been effective at promoting group learning
  - 1,402 diabetic enrollees in 2004 and 52.2 avoided 2005 hospitalizations from incentives; hospitalization rates for diabetes may be significantly lowered by better timing and dosage of insulin

# Conclusions

- We find substantial changes in hospitalization from wellness incentives
- While behavioral changes can have big impacts, it has been hard for employer programs to impact behavior
- One exception is Volpp et al. (2009) NEJM study which finds that financial incentives of \$750 had persistent effects on smoking behavior
- The *annual* financial incentives here are larger than in Volpp
- It is likely that a combination of factors – financial, group learning, informational and institutional priorities – may be important in this case
- A limitation is that we cannot disentangle different mechanisms by which the incentives had an effect